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PREHISTORIC JASPER QUARRIES IN THE LEHIGH HILLS.

[BY HENRY C. MERCER.]

Beginning at Durham, Bucks county, Pa., and following the trend of the Lehigh hills towards the Schuylkill near Reading, and generally in close connection with veins of hematite, occurs a series of outcrops of the hard homogeneous rock known as jasper. This many-colored stone with its smooth conchoidal fracture stood somewhat in the same relation to the North American Indian that iron stands to us. With it he fashioned his best spears, perforators, knives, arrowheads, and scrapers. No less diligently did he seek for it than does the man of the 19th century search for that great lever of his power and progress, iron; and no less persistently did he quarry it, shape it to his needs and transport it to great distances.

So Indians in the West had been known to quarry jasper at the now famous "Flint Ridge," in Ohio; novaculite at their great quarries in Garland county, Ark.; jasper, or hornstone, again in the Indian Territory; quartzite at Piney Branch, in the District of Columbia; obsidian, or volcanic glass, in the Yellowstone Park and Mexico, and other workable stones at other places. But whence the jasper supply came from east of the Alleghenies, has long remained a mystery. Even the State geological surveys did not seem to adequately recognize the existence of jasper in the Eastern Lehigh hills; so that the recent series of discoveries, by expeditions in the interest of the University of Pennsylvania, have thrown a decidedly unexpected light upon the story of ancient man in the Delaware Valley.

The thanks of the university are due to Mr. Chas. Laubach, of Durham, who first introduced the explorers, in 1891, to the aboriginal jasper quarry on Rattle-snake hill, at Durham, Bucks county, and to Mr. A. F. Berlin, of Allentown, who, by a series of valuable clues, greatly furthered the work of subsequent research.

How did the Indian, armed only with tools of wood, bone, stone or beaten native copper, make the excavations averaging sometimes 20 feet in depth and 100 in diameter? Did he use pick-axes made of deer antlers, as did the ancient flint workers of Brandon, in England? Did he encounter the rock in solid ledges as in Arkansas, or in loose nodules? Did he reduce it by fire, splinter it with stone hammers such as are found at the prehistoric copper mines on Isle Royale in Lake Superior, or by battering boulder against boulder? Did he finally chip the material into arrowheads at the quarry, or carry away lumps of the stone to be worked up elsewhere?

These and many other questions we asked ourselves on a first glance at the bramble-grown pits and refuse heaps on the lonely hilltop at Durham. And after a careful study of the place several expeditions set out on this and the preceding summer, resulting in the discovery of eight new quarries lying in a continuous line from the Delaware almost to the Schuylkill.

All, though varying greatly in size and quality of material, tell the same story.

In some the excavations, filled with forest mould and overgrown with trees, would escape the attention of the casual rambler until the piles of flakes, yellow and rose-tinted, easily displayed by scraping away the leaves that concealed them, revealed the handiwork of the ancient quarryman.

But at others, as at Macungie and Vera Cruz, the passer-by would halt in amazement. The appearance is too unusual, the work too vast—100 to 150 pits, some of them 15 feet deep and 100 to 150 feet in diameter, is no everyday sight. Again the tinted flakes and refuse heaps tell the tale, and the neighboring wheat field glistens with fragments, yellow, blue, purple, red, lavender and veined in many hues. The forest, too, has set its stamp of age upon the scene, and an old chestnut stumpt growing on the side of one of the pits, upon which we counted 196 rings, proves that the workman had abandoned his shaft to the growth of underbrush before the time (1682) that William Penn bought his first tract of land from Indians on the Delaware.

As, standing before the ancient works of the Mound-builders at Grave creek Marietta and Newark a strange feeling born of awe steals over us, so here by degrees the scene assumes its true hue of wonder. We have had a glance beyond the boundary lines of history into the unilluminated darkness of this continent's past, and for a moment heard the echoes of that vast forest mysterious with the fate of lost races that for untold ages darkened the new world before the coming of Columbus and DeSoto.

It was important to learn that at two of the largest quarries, farmers, believing the pits to have been the work of early Spanish gold seekers, had dug deep trenches across several of them to find that in most instances their original depth was greatly lessened by the caving in of the sides; that some of them, judging from the traces of disturbance in the soil, had reached a depth of 40 feet; that some were square rather than round; that there had been no tunneling done, but that the pits had been enlarged laterally from the surface downward.

In the bottom of two pits, at least, said my informant, charcoal was found, and in two cases, deep buried in clay at the very bottom, round billets of wood about three feet in length with points at one end hardened by charring. In all cases nodules of jasper were to a great extent wanting in the pits, but were found embedded in the soil as soon as the unworked edges of the excavations were reached.

Our own preliminary work seemed to indicate that the Indians had in no cases attacked a solid vein of the material, but finding it in nodules on the surface had removed these to find others embedded beneath them. It was by prying these out one by one and scraping away the surrounding clay that the pits were made. That fire had been extensively used on the surface nodules there was no question, whether in the clearing away of underbrush for mining at successive times, or, as seemed probable in one case, in reducing the larger fragments and coloring yellow jasper red.

Turning to the refuse heaps, and from the myriads of artificially flaked fragments exhibiting no succinct design that strew the surface everywhere, we find—(a) a series of well battered quartzite hammer stones, not pitted on their sides, and variously from 1¼ to 5 and 6 inches in diameter; (b) a mass of very interesting, artificially shaped blocks, that all tend in the direction of an ideal leaf-shaped form, and which in their ruder stages resemble the famous implements or objects from Trenton and Ohio known as "turtle-backs" and "paleoliths."

Our attention is further called to the facts that there are few, very few, arrowheads at these spots, and as yet no traces of pottery, no banner stones, net sinkers, gorgets, or grooved axes; that, in a word, these remote places, buried in the forest inconveniently far from water and arable land, were not fit for village sites. They were quarries, nothing more, nothing less whither the jasper-using modern Indian as known to Capt. John Smith, Campanius and Kalm, resorted, must have resorted, to quarry his material, knock it into portable shape and carry it away to the distant village.

By a few blows of the pebble hammer the weathered surface of the nodule is chipped away and the thick block takes a pointed shape. A series of further blows, more careful and probably struck with the small hammers, produce a serrated cutting edge around the whole fragment which now well marked with the secondary chipping that unmistakably proclaims the handiwork of man, though still rude, clumsy and an inch or two thick in the middle, has become the typical "turtle-back" of Madisonville, Ohio, or Trenton. It may be that a final series of flakings, whether due still to the hammer or to pressure, results in a quite symmetrical blade, lightened to the desired weight and ready for transport.

There the quarryman's work seems to have stopped, if it always went so far. and the hoard of blank blades ready to be finished or specialized by some local arrowhead maker into perforators, arrowheads, spears or knives, as the case may be, is carried away. When for a time its owner is compelled to part company with it he buries it in the ground for safe keeping or to render the material softer for future work, and there for a dozen reasons it may remain for long years, to be discovered at last by a surprised ploughman.

Such a cache of hitherto "inexplicable" leaf shape implements consisting of 116 yellowish argillite blades we found in 1891 on Ridges Island, on the Delaware, another of 107 of blue argillite was obtained for us by Mr. Doan, at Bridge Valley, Bucks county, Pa., last May and another of 9 blanks of chert was found by us in June of this year, on an island in the Susquehanna.

The story of the Lehigh jasper quarries thus glanced at, but soon to be fully and carefully studied, is thus far a corroboration in main of the recent researches of Mr. W. H. Holmes at Piney Branch in the Indian Territory, and in Garland county, Arkansas. Is it the story of all jasper quarries in the United States? Is it the story as well of the argillite sandstone and quartzite quarry sites and the obsidian workings not yet studied? In a word—are we right in supposing that this process of passing from the shapeless block to the "turtle-back," and from the "turtle-back" to the thin leaf-shaped blank, and thence to the spear or finished implement represents the necessary steps, through which all peoples in an age of stone have passed, in the fashioning of their rock hewn tools?

Thirty years ago Indians were chipping arrowheads of obsidian and quartz on the shores of the Sacramento. Hundreds of them still live in the United States and Canada who can explain the whole matter, and their opinion has been asked and their work described, but the accounts of their questioners have been vague, contradictory and unsystematic. None of them explain the quarry, the turtle-back or the cache implement.

Caleb Lyon, who saw an arrowhead maker at work, refers only to a slab of obsidian one-fourth of an inch thick, split from a pebble and flaked by blows. T. R. Peale speaks of Shastas hammering a mass of jasper, agate or chert with a round-faced stone and finishing up the edges with a notched bone, as a glazier chips glass. Schoolcraft saw an anvil of wood or some hard substance placed on the thigh, upon which a piece of jasper was held at rest to be hammered by something undescribed. Captain John Smith tells how the Indian "quickly maketh an arrowhead of splints of stone in the form of a heart, with a little bone, which he ever weareth at his bracecpt." Torquemada and Hernandez briefly describe seeing Mexicans sending off long flakes of obsidian, with which certain Spaniards had their beards shaved, by pressing a wooden punch on a nucleus of obsidian held between the feet.

Admiral Sir E. Belcher saw Esquimaux, California Indians and Sandwich Islanders fracturing chert blocks with slight taps of nephrite hammers, and then flaking the splinters wedged in a spoon shaped cavity in a log, with a point of deer horn.* And so on. Lieutenant E. J. Beckwith and Catlin tell of flaking small pieces and thin slabs of quartz and obsidian, by direct pressure and indirect pounding upon a bone punch. And certain white men have recently made arrowheads out of curiosity or to palm them off upon collectors, but neither the conflicting accounts nor the amateur experiments explain the quarry, the turtle-back or the leaf-shaped form of the cach. Evidently some of the chief underlying features of the first and greatest of man's primæval arts have not yet been grasped. The living Indians who remember the process must be questioned again.

Turning back to the quarries and refuse heaps, and passing by the many questions of deep archæological interest that they suggest, suffice it here to say that for one fact already mentioned they claim attention among the foremost fields of American research.

Here at a distance of about forty miles from Trenton are scores of jasper specimens exactly resembling the forms found there buried 15 and 20 feet in the glacial gravels, imitations in other words of the so-called "paleolith," or implement of the savage ice man, who 7,000 years ago chipped river pebbles on the freshet swept banks of the Delaware.

We have been told that this object from Trenton and Madisonville is a finished implement, a type of an epoch, that the savage who fashioned it was little better than an ape in culture, ignorant even of the use of the bow and a slayer of his prey with clubs and stones. And science has willingly stolen into the by-paths of wonder and speculation to suggest his origin and fate. Akin, it was said, to the river drift man of Europe, he crossed the North Atlantic on an isthmus, that in pre-glacial times stretched from Britain to Greenland, to dwell on the cold shores of the Delaware when the great glacier stretched its coping of ice from the Hudson's mouth to Oregon and while the Niagara river yet tumbled its cataract in Lake Ontario at the sight of Lewistown.

At first as we take up these other shapes from the quarry rude as the rudest from Trenton, yet geoloically an affair of yesterday, the supposed lapse of ages between them and the Trenton implements seems to fade away. We are almost startled. The doors of archæology's wonder chamber have been thrown open, its treasures displayed and the strange form of paleolithic man, slipping out of our grasp, seems ready to vanish into the limbo of chimeras. But a few moments' reflection rebalances our thoughts.

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*See for these narratives except Beckwith (Pacific R. R. Survey Vol. 2, p. 43) E. T. Stevens' Flint Chips, p. 57.

What if these modern stones do resemble "paleoliths?" What if the Trenton forms like these were only steps in the process of fashioning blades not yet found in the glacial drift? What if the Trenton "turtle-back" were not a finished implement as has been declared?

Is it any the less old? Is the ice man any the less interesting because we can no longer pick up a stone on the surface and say "This is a paleolith?" Is he any the less a glacial inhabitant because modern Indians have duplicated one of his stone relics, and we are obliged to reform our American definition of the word "paleolith?"

It is well that we have this new light on the great art of arts that most concerned man's life and happiness in the untold ages of his childhood. One source of error and confusion has been cleared away from the subject, and we fully realize that what shall in the future determine the age and nature of these stones is not their form or resemblance to European specimens, but their geological position.

Let us turn now to the Indian who still remembers his past and if we can fully learn the quarryman's secret from him and from careful excavation of the pre-historic pits. Then with the eyes wide open we are ready for another ransacking of the gravel pits of Trenton and Madisonville. More sharply than ever we shall look for a bit of pottery 7,000 years old, a tell-tale arrowhead or grooved axe, and ask the questions: First—Have we been deceived? Have the classic stones slipped down into the gravel through the fissures of earthquakes, the holes left by roots, the cavities formed by upheaved trees, or by the deceptive readjustments of strata that sometimes puzzle geologists on the face of bluffs and banks? And then, where, in these diluvian gravels, are the hammer stones, and the chips, and the signs of use on the "turtle-backs" and the thinned-down blades, which shall prove for what purpose glacial man might have made the leaf-shaped forms, and whether like the modern Indian he treated them only as blocked out types of more specialized tools, or whether still a child in the stone-chipper's art, he halted at the second step in the process, and unskilled to go farther, used the now famous "Turtleback" as a finished implement sufficient for his primitive needs.

DOYLESTON, October 1st, 1892.

PALÆOLITHIC MAN IN NORTH AMERICA.

[BY DR. C. C. ABBOTT.]

[Reprinted from Science.]

The ghost of palælithic man has arisen to plague the geologists at Washington; and those that look upon them as little gods are all shouting "Me too." As the cause of all this mischief, it is fitting that I should speak in my own defence. The scientific men of Washington claim a monopoly of knowledge and so occupy a peculiar position, self-assumed, of course. That which is offered the world independently of them, must be stamped by their approval or condemned, and it is never the former. This condition of affairs really handicaps them at the outset, and not one can enter the field unbiassed. Indeed, they go out instructed to bring in such and such results, and none other. This is pre-eminently so in the question of the antiquity of man in North America. The recent appearance of Wright's book, "Man and the Glacial Period," has set their tongues wagging, but palæolithic man is not to be downed even by such an array of notables, marshalled to defeat them. Salisbury's cunning argumentation, McGee's shaggy front, Holme's imperious "begone!" and Brinton's persuasive smile do not make him afraid. He returned to earth in his own good time and came to stay!

Of the alleged evidences brought forward by others I have nothing to say, but something to record concerning my own investigations, that may have a bearing on the question. We must admit that, at some given time in the past, man appeared on this continent; but just when, no one has ventured to assert. Certainly in no one communication to scientific or popular literature have I done more than claim the discovery of evidence of his comparatively primitive condition when he did arrive; and now after twenty years of careful and unremitted study of the valley of the Delaware River, I see no reason to change my opinion, but a great deal to substantiate it.

Were the evidences of man's occupancy of this region one associated and confused mass, an attempt made to dissociate its components into rude and more elaborate forms and to say of the former, this is old, and of the latter, not so ancient, then the scientific world might well be up in arms and cry down the apparent absurdidy—but this is not the case.

Of course, if we claim, as for instance Mr. Holme's practically does, in spite of denial, that every so-called palæolithic implement is a "reject," whether the man who cast it aside lived in Europe or America, the whole subject falls to the ground; but accepting palæolithic man as a one-time feature of other continents, and believing no geological reasons have been brought forward why he might not have lived in North America also, it is justifiable to consider the archæological significance of such objects as the late Wyman said were not distinguishable from European forms, except by the material by which they were made.

Now, as a matter of fact, a considerable number of just such forms have been found in the gravel deposits at Trenton, N. J., and at a significant depth, but, says the geologist, what of the age of this deposit? The whole question hinges on this. Professor Salisbury asserts that since the deposit was originally laid down, it has been reassorted. Grant this, and what then? If the reassortment took place in "Indian" times, how does it happen that only this one form and simple flakes are found entombed? Holmes here steps in and says "easy enough," the Indian went to the river-shore, chipped pebbles, and retired to the back country, leaving his "rejects." But are we to suppose the Indian never went to the water's edge for any other purpose? Did he not take his finished implements to the river to fish and hunt? Did he not cross the river by a raft, canoe or by swimming? Did he necessarily always live back from the stream? Common sense points out that he must have had the whole range of his goods and chattels continually at and on the water, and are we to suppose that never a knife, arrow-point, bead, or pot was lost? It is too absurd to consider; and this reassortment of the gravel-beds must have buried a great deal more than "rejects." Again, it has been asserted that the assumed palæolithic implements are only in "talus," Carvill Lewis, according to Brinton, says what I held to be undisturbed layers, were recently an "ancient talus." Possibly, but how ancient? In at least a dozen instances this asserted "old talus" was caused by floods having a transporting power equal to piling up layers alternately of sand and gravel, and then, as if to anticipate the present tempest in a tea-pot, placed a bowlder, weighing tons, over it all, for fear that the poor palæolith might run away. Now, when grooved axes and polished celts are found under like conditions, I am willing to leave the field as fast as my short legs will permit, and not before.

Professor Salisbury has asserted that there is need of expert testimony to determine the precise age of the implement bearing gravels, and Dr. Brinton insists that no opinion as to the geological age of a gravel can be received from any but an expert geologist. Grant it; but the trouble is these "expert geologists" are raræ aves that were never yet known to agree among themselves, and it becomes a mere matter of personal opinion after all. I lay claim to a smattering of gravel-ology. I have lived on pebbles so long that I have become flinty-hearted so far as criticism is concerned, and when I find gravel stratified and unstratified, I know and assert the difference; and when a palæolithic implement is found in gravel beneath layers of sand and pebbles, beneath huge bowlders (not merely at a lower horizon, but directly beneath them), I do not, and no reasonable person should want another to tell him that the two were laid down together, or the big bowlder was dropped upon the implement, which anticipated its coming. Up pops some "authority" and declaims the possibility that the ground was washed from beneath the big stone and the implement slipped in. Well, we can go on supposing till the crack o'doom, but as to proof, that is another matter. These geological jugglers will prove yet that the Indians bought the Delaware Valley from William Penn.

Certainly too much value is put on this matter of expert testimony. Then, again, in spite of all that has been written and said, the assertion is made that palæolithic implements are found only at the present river-shore. Of course we find them there now, because the gravel is exposed, but not there alone. A full mile back from the river they have been found in digging cellars, sinking wells, and in the cut of the Pennsylvania Railroad, east of Trenton, N. J. All this area may have been "reassorted," but in such delicate fashion that the strata are not broken, and it suggests that the manner of it was like turning over a book from one cover to the other.

Again, it has been objected that no animal remains have been found: but Cook found a mastodon, and I have, more significant yet, a valve of a Unio: and what of human remains, long since reported? There are, too, at the Peabody Museum, three human crania, two of which were taken from the gravel and one found in the bed of a creek, and these three, identical in character, stand alone in a collection of nearly three thousand Indian crania.

It is the weak point of Wright's book that he did not prepare the archæological portion at the Peabody Museum, with my collection under his eyes. If he had, the critics would not have had a leg to stand upon.

The implements, too, speak for themselves. If "rejects" as Holmes dogmatically asserts, why is it that they were carried to the high ground, and are found today, solitary and alone, silent witnesses of that long ago, when it was the principal weapon of the early man who used them? And if "rejects," made at the water's edge, where are the chips resulting from their fashioning? They are not scattered broadside over the river-shore as are the implements; but we do find in spots where "rejects" were made in numbers, and know the fact because of the accummulated chips. It is easy to conceive a theory and bend the facts to it; very, very easy; but the trick is found out, sooner or later.

"But they show no sign of use" pipes some impatient kicker. Prove it; and does the spear or arrow-point show signs of use? Of over a thousand chipped jasper scrapers in the Abbott collection at the Peabody Museum, not a half-dozen show signs of use, and the same may be said of drills.

These rude implements are made of argillite, and the use of this material was continued down to the time of European contact, being less and less used after the discovery of jasper. The magnificent results of Mr. Ernest Volk's explorations, under the direction of Putnam, in the valley of the Delaware, clearly prove this, and so substantiate what I have claimed for all these years and is it not significant that some of the most finished specimens of palæolithic implements have been found in situ? By what authority do the critics say they are too rude to be effective? Is any person living so in touch with primitive man today as to assert what he could and could not have used? It is well to bear in mind that many an undoubted Indian implement, just as rude, was used by these later people. Look at the rude spade and slightly chipped but girdled pebbles that were used as club-heads.

Of course in the days of palæolithic implement-making there would be "rejects," and the critic must not attempt to prove too much, because such are found, even in undisturbed gravel. Many a pebble, too, has been chipped until suggestive of an implement, by the detaching of flakes to be used as knives, as Mercer pointed out at the Rochester meeting of the A. A. A. S., and a splinter of stone was not too elaborate an implement for supposed palæolithic man to have used.

And now, in conclusion, let us remember that the native American—the Indian—is a type distinct from all other peoples; let us not forget that their languages are all a purely home product, and that these facts show undeniably a necessarily long occupancy of this continent, shut out for centuries from all the world. If he, as a fully equipped Indian, came from another region beyond the seas, his similarity to the people of that region could be traced. As it is, he came, so far as our knowledge now extends, when man over the whole world was not racially developed as now, and so when in a comparatively primitive condition; such a condition as is suggested by the simplest of implements, whether for the chase or domestic uses. Here, in North America, this early man became a potter, invented the bow, and gradually reached that status of culture, differing in degree in different parts of the country, in which he was found by European explorers.

As a student of archæology, I submit that this occupancy of the continent commenced when there was a changing condition of the river valleys in progress; but whether that change was subsequent to the glacial epoch or during it, deponent saith not. That it was during a time when rock-transporting floods were common, I do claim. That it was when ruder than ordinary Indian implements were the common tools of the people, I do claim, for how else could only such rude forms be associated as they have been shown to be with gravels that show no evidence of disturbance except such as forces not now in operation, effected? It is true, palæolithic and Indian objects are now associated, but they are also separate and apart. What I contend for is the sequence of events of the original use of a rude weapon or tool, the one implement of that day that was manufactured, and, as time rolled on, the production of more elaborate forms, and all that pertains, the world over, to the accepted neolithic stage of human advancement.

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MAN AND THE GLACIAL PERIOD.

[BY G. FREDERICK WRIGHT.]

[Reprint from Science.]

I acknowledge with pleasure the courtesy with which Dr. Brinton, in his review of "Man and the Glacial Period," has dealt with the question of the genuineness of the reported discoveries of implements in the glacial gravels of the United States. This, of course, was the first question to be settled. Were implements of human manufacture really found in undisturbed strata of gravel which was deposited during the glacial period? If this question is settled in the affirmative, then all glacial geology has direct bearing upon the question of archæology. If it is decided in the negative, glacial geology remains the same, but it ceases to have interest in connection with archæology. I am glad to have the issue so clearly made by Dr. Brinton, and thereby to have occasion to present more specifically my reasons for belief in the genuineness of these discoveries.

The evidence naturally begins with that at Trenton, N. J., where Dr. C. C. Abbott has been so long at work. Dr. Abbott, it is true, is not a professional geologist, but his familiarity with the gravel at Trenton, where he resides, the exceptional opportunities afforded to him for investigation, and the frequent visits of geologists, have made him an expert whose opinion is of the highest value upon the question of the undisturbed character of the gravel deposit. The gravel banks which he has examined so long and so carefully have been exposed in two ways: 1st, by the undermining of floods on the river side, but principally by the excavations which have been made by the railroad and by private parties in search of gravel. For years the railroads have been at work digging away the side of the banks until they had removed a great many acres of the gravel to a depth of twenty or twenty-five feet. Any-one can see that in such conditions there has been no chance for "creep" or landslides to have disturbed the stratification, for the whole area was full of gravel and there was no chance of disturbance by natural causes. Now Dr. Abbott's testimony is that up to the year 1888. Sixty of the four hundred palæolithic implements which he had found at Trenton had been found at recorded depths in the gravel. Coming down to specifications, he describes in his reports the discovery of one (see "Primitive Industry," 492) found while watching the progress of an extensive excavation in Centre Street, which was nearly seven feet below the surface, surrounded by a mass of large cobble stones and boulders, one of the latter overlying it. Another was found at the bluff at Trenton, in a narrow gorge where the material forming the sides of the chasm had not been displaced, under a large boulder nine feet below the surface (ib. 496). Another was found in a perpendicular exposure of the bluff immediately after the detachment of a large mass of material, and in a surface that had but the day before been exposed, and had not yet begun to crumble. The specimen was twenty-one feet from the surface of the ground.

In all these and numerous other cases Dr. Abbott's attention was specially directed to the question of the undisturbed character of the gravel, having been cautioned upon this point in the early part of his investigations.

Nor is he the only one who has found implements which were clearly in those undisturbed gravel deposits. Professor Shaler (Report of the Peabody Museum at Cambridge, Vol. II, p. 45) found two of the implements twelve feet below the top of the bank, where he says that it was difficult for him to believe that they could have traveled down from the superficial soil, and he expresses it as his opinion, after having gone over the ground with Dr. Abbott, that the implements which Dr. Abbott had found occurred under conditions that made it "quite unquestionable that they were deposited at a depth of many feet below the soil, and are really mingled with the drift matter that forms the section before described." This is the description which I have quoted in my volume (p. 242). Professor Putnam, also, permanently found implements in position which he decided to be certainly undisturbed gravel (see 14th Annual Report of Peabody Museum, p. 23, and Proc. Boston Society of Natural History for Jan. 19, 1880.

The question of the occurrence of these implements in undisturbed gravel was so thoroughly discussed by the scientific men in Boston who visited the region about 1880 that I had supposed there was no longer any reasonable doubt concerning the facts, and I feel sure that anyone who goes through the records of the Peabody Museum and the Boston Society of Natural History about that time will be convinced. At the same time I would say that I have been unable myself to find any implements in place, though I have frequently examined the bank. But I have not felt at liberty on that account to doubt the abundant testimony of others who have. If we are limited to believing only what we ourselves have seen, our knowledge will be unduly circumscribed: and though I might be more certain of the facts if I had seen them myself, I do not see how I could increase the confidence, in the facts, of other people who could disregard the testimony already in hand.

Passing now form the discoveries at Trenton, N. J., to those in gravels of corresponding age in Ohio, we do not come to the subject with the same amount of incredulity with which we first entered the evidence at Trenton. Dr. Metz has been for years co-operating with Professor Putnam in various investigations, and the discovery of a flint implement by him in excavating for a cistern in his own yard was such that no reasonable question can be raised as to its having been undisturbed since the deposit was made, and there can be no reasonable question that the deposit was made during the continuance of glacial conditions in the State. I have described the conditions in a report to the Archæological Society of Ohio for December, 1887.

The discovery of a palæolithic implement at New Comerstown, Ohio, by Mr. W. C. Mills, is an equally well-attested case. Mr. Mills, like Dr. Abbott, resided in close proximity to an extensive glacial terrace to which the railroad was resorting for ballast. Many acres of gravel have been removed. During the progress of these excavations Mr. Mills repeatedly visited the pit and after a fresh excavation discovered the implement in a perpendicular face of the bank fifteen feet below the surface. The facts were recorded in his diary and the implement placed in the general collection of Indian relics which he was making. Mr. Mills was at that time engaged in business in the place, but he had been a pupil of Professor Orton in geology, and was well qualified to judge of the undisturbed character of the gravel in which this implement was found. As anyone can see by consulting the photographic illustrations on pp. 252 and 253 of my volume, the implement itself is an exact duplicate, so far as form is concerned, of one which I have in my own collection, from Amiens, France, and which came to me through Professor Asa Gray, directly from the collection of Dr. Evans in London. The New Comerstown implement was submitted to Professor Haynes of Boston and to others at a meeting of the Boston Society of Natural History, and by them pronounced to have all the essential characteristics of palæolithic age. The full report upon this is found in Tract No. 75 of the Western Reserve Historical Society, Cleveland.

As to Miss Babbitt's discoveries at Little Falls, Minn., I have nothing further to say than that up to the present year no serious question had been raised concerning the glacial age of the gravel in which her implements were found. But as questions have now been raised in view of recent examinations, I will not attempt to discuss the matter until the facts are more fully published. But the removal of this case from the category would not disturb confidence in the evidence connecting man with the glacial period in New Jersey and Ohio.

The statement of Dr. Brinton that a well-known government geologist had recognized the Nampa image "as a clay toy manufactured by the neighboring Pocatello Indians" is news to me, and it is due to the public that this official's knowledge of the subject should be more specifically detailed. The facts as I have brought them out by prolonged and minute inquiry do not warrant any such flippant treatment of the evidence. Professor Putnam, to whose inspection the image was subjected when it first came in my hands, at once pronounced it an antiquity of some sort, unlike anything which he knew to be in existence among the aboriginal tribes. I need not say that Professor Putnam's opinion upon a question of that sort is of the very highest value. There were upon the image patches of the anhydrous oxide of iron, which to him and other experts were indubitable evidence that it had lain for a long time in the earth. Subsequently I ascertained, while on the ground at Nampa, that the shade of color in this iron oxide upon it corresponded exactly to that which had formed upon the clay concretions which came up in large quantities from the same stratum in which the image was alleged to have been found. I have also, I think, made it evident that the burying of human relics even to the great depth of 320 feet in the Snake River Valley may not be much more surprising than the burial of the remains of man in Pompeii and Herculaneum, and that the date of this burial may not have been very many thousand years ago. The direct evidence to the fact that this little image, an inch and a half long, came up from the depth reported is about as convincing as we can have for any fact which depends for credence upon human testimony. There has been nothing with regard to the appearance of the parties suggesting fraud. Mr. Cumming, the superintendent of that division of the

Union Pacific Railroad, whose attention to the facts was called the day after the discovery, is a Harvard College graduate, of extended legal education and wide practical experience, who knew all the parties and was familiar with the circumstances, and investigated them upon the ground. Charles Francis Adams emphatically affirms that Mr. Cumming's evidence is entitled to as much consideration as the evidence of any scientific man would be. Anyone who wishes to get my detailed report of the evidence will find it in the Proceedings of the Boston Society of Natural History for Jan. 1. 1890. and Feb. 18. 1891

The discoveries of human implements under Table Mountain in California are in close analogy with this discovery at Nampa, in the Snake River Valley, and the same remarks have been made respecting them that Dr. Brinton reports concerning the Nampa image, namely, that they are modern implements at present in use among the local tribes of Indians. But no such offhand opinion as this can break the force of the evidence which has accummulated in support of their having been found in deposits which have been undisturbed since the great lava outflows which constitute what is called the Sonora Table Mountain. The evidence concerning the Calaveras skull has been exhaustively discussed by Prof. Whitney, of Harvard College, who pronounces the facts to be beyond all reasonable doubt. At the meeting of the Geological Society in Washington in January, 1891, three independent discoveries of human implements in conditions similar to those assigned to the Calaveras skull were presented. I had myself obtained information at Sonora of the discovery of a stone-mortar in the tunnel of the Empire mine of which the evidence was satisfactory beyond reasonable doubt. The discovery was made by the assistant surveyor of the county in the tunnel of a mine under Table Mountain, which was owned by his father and where work is still prosecuted. The mortar had been given away to another person, but it has since come into my hands and is preserved in the Museum of the Western Reserve Historical Society of Cleveland.

At the same meeting Mr. Geo. H. Becker, of the U. S. Geological Survey, presented a similar mortar found under Table Mountain some years before by Mr. Neale, a mining engineer. Mr. Neale signed an affidavit detailing the particulars, and his remembrance of the situation was so minute that there could be no question of the undisturbed character of the deposits. Mr. Becker well remarks that Mr. Neale,s judgment as mining-engineer concerning the undisturbed character of the deposit is the highest evidence that can possibly be obtained, for that is a point to which the miner's attention is constantly directed, on account of the danger attending the opening of any old excavation.

The third new evidence offered was that of Mr. Clarence King, who had just presented to the Smithsonian Institution a fragment of a pestle which he had taken with his own hands, in the vicinity of the two previous places mentioned, from the undisturbed gravel beds underlying Table Mountain. I need not say that Mr. Becker and Mr. King are two geologists of the very highest standing in the country, and that they both have unusual familiarity with the phenomena of that region, and they both, together with Prof. Marsh, Prof. Putnam, and W. H. Dall, express their unqualified belief in reference to the Calaveras skull that it was found in place in the gravel beneath this same stream of lava.

But I have already made my communication too long. I trust, however, upon your forbearance in publishing it, since the facts are too numerous to be compressed into less space of description, and a volume would be required to give all the evidence in detail. In my book upon "Man and the Glacial Period" I was called upon to discuss a very broad subject in a very small volume, and so could not enter into details. I endeavored, however, to limit myself to facts of which there was abundant proof, if they should ever be called in question. And I would repeat that I am glad of the revival of interest in the subject which will be created by the expression of such doubts as still remain in Dr. Brinton's mind. I have no question but full discussion will dispel the uncertainty that may exist. G. FREDERICK WRIGHT.

OBERLIN, O., NOV. 1, 1892.

LEHIGH ISLAND AND ITS RELICS.

[BY A. F. BERLIN.]

The cultivated island mentioned above is situated in the Lehigh river, at Allentown, Pa., and covers an area of sixty acres. It is formed of river drift, a mass of rolled boulders and pebbles, covered with a sandy loam, the whole being from four to fifteen feet in thickness. It is a remnant, a reminder of the once powerful rush of waters originating from the receding and great meeting glaciers toward the North, which on its turbulent way toward the ocean, scooped out the present Lehigh Valley for a distance of eighty miles, seventy-five to one hundred and fifty feet.

Seventeen miles below the island this raging stream emptied into a still larger river which hurled the contents of mud, sand and boulders toward the head of the then Delaware bay, which, in glacial times, was where now stands the city of Trenton, New Jersey.

PALÆOLITHS.—It will be proper to mention here first those rude objects of stone, which in the past have created and at the present are causing so much discussion. I succeeded after careful search in picking up, at different times, from the surface eight of these implements, nor was I fortunate in obtaining any where the sand-diggers worked. I also watched carefully at the sand-wash but found none there. I infer from this that they are very rare on this island. Six of the objects found were made of quartzite; the seventh of yellow jasper. All represent the forms of the river-drift implements from England and France, as well as those discovered by Dr. C. C. Abbott in the gravel at Trenton. Dr. Abbott's objects are made from argillite, and were found six to twenty feet below the surface. Mine being surface discoveries indicate but little. Although rudely made secondary chipping is shown plainly along the edges, from which one is compelled to infer that they were finished implements.

We are told in a tradition of the Tuscarora Indians, who claim they arrived on the Virginian coast about the year 1300, that they found there a race who knew nothing of Indian corn or maize and were eaters of raw flesh. The Northmen in the year 1000 found the natives of Vinland, probably near Rhode

Island, of the same race as those they were familiar with in Labrador. Eskimo is from the Algonkin word Eskimantic—eaters of raw flesh (The Myths of the New World, foot-note p. 23. Dr. D. G. Brinton).

If, then, these people lived as far south as Virginia, they certainly in roaming over the country dropped their implements or left them on their camping sites when driven northward by the superior race with which they came in contact. Then, too, they are so similar to the stone objects used by them today that it will not be out of place to infer they were made by the progenitors of these northern people when living here.

Now, as the writer has said before, much has been written for and against the palæolith and its connection with pre-glacial, glacial, or post-glacial man. Mr. W. H. Holmes, a polished and learned archæologist, a member of that band of scientists at Washington, D. C., well known as "the Bureau of Ethnology," since its organization under the able management of Major J. W. Powell, has been doing archæological work of which not enough good can be said and which can be attested upon examination of the yearly reports issued by the organization, claims they have no connection at all with the man living during the glacial age, but are unfinished implements, chipped into rude form at the quarries where they were obtained and then in this state carried elsewhere by the maker to be modeled into such shapes as were found to be wanting. That many of them were "rejects" thrown aside on account of some fault in the stone, or from fracture in shipping. I quote from his paper, "A Quarry Workshop of the Flaked stone Implement Makers in the District of Columbia," in the American Anthropologist, Vol. III, p. 24: "As to the present state of the evidence I hold that there can be but one opinion. It is impossible to show that there exists the slightest trace of any other race than the American Indian as he is known to us, and I am convinced that if the great Powhatan should at this late day rise from the dead and claim for his people all the stone implements of the Potomac valley, no reasonable objection could be made to the claim." Mr. Holmes bases his conclusions, as has been seen, upon the discoveries near Washington, but it becomes evident as one reads his paper that he has little faith in the so-called glacial discoveries.

Says Mr. Thomas Wilson, curator of the archæological department of the Smithsonian Institution, in Report of U. S. National Museum, 1888, p. 629: "The investigations concerning these implements have not been very profound nor has it been settled to the satisfaction of all pre-historic archæologists, perhaps not even a majority, that they are truly palæolithic implements. There have been various contentions concerning this."

But on the other side stand two archæological giants, experts, men of ripe experience whose investigations and words count for something. Them, too, must be given a hearing. Is there an archæologist who understands better or knows more about the gravel deposits around the city of Trenton than does the discoverer of the palæoliths found there? Has Dr. Abbott not lived right on these deposits for years and have not the most careful and scientific examinations been made by him? Some of the ablest geologists who were on the spot coincided with him. Read his article "Palæolithic Man in North America," in this journal, reprinted from "Science" No. 510, p. 270.

And what of Prof. G. Frederick Wright? Who than he has greater knowedge of the great sea of ice, which many thousands of years ago covered more than half of our northern continent? Should not the word of the man who followed the moraines left in the retreat of this great sheet from ocean to ocean be of some value? See his letter in this number taken from "Science," No. 510, p. 275.

Thus, at present, the matter rests and who will gain the mastery remains to be told. Will we ever for a certainty ascertain that in that dim, distant, and cold age lived a being of human form, brutish as the animals around him, yet within him a spark of intelligence giving him the knowledge that a sharpened stone would better aid in defending him and his from attack and in destroying that which assailed him?

Graves.—But one grave, as much as the writer knows has been found. From it, at a depth of four feet, was taken the skeleton of a female in a sitting position, facing toward the East. With the skeleton were found a few relics of yellow jasper, shaped like the blade of a knife four inches long, one inch wide and pointed. I was fortunate in obtaining one of the blades. The others were scattered to the winds! The skeleton is poor and broken condition was also given me, but as the partner of my joys and sorrows insisted that one skeleton in the family closet was enough, I parted with it.

Pottery.—No perfect vessel has ever been found. I have picked up pieces and came across part, about two-thirds, of a vessel, which when perfect held about two quarts. It had a rounded bottom, from which I infer that it was suspended while in use. The fragments picked up, and not in plenty, are ornamented in lines and dots similar to that shown by Dr. Abbott in "Primitive Industries." They appear to have been made of clay, sand and shells, no doubt of the mussel which is found in the river surrounding the island.

Net-Sinkers.—I have found quite a good number of these implements. They are made from oval water-worn stones, having flattened faces with a notch on each side and weighing from one-half ounce to almost four pounds. This monster, 9¼ inches long, 3¾ inches wide at its broadest part, made from a water-rolled stone, no doubt did better service as the anchor of some aborigine's dugout than a net-sinker. Eighteen miles N. W. from here empties into the Lehigh river "Aquashicola" creek. This in English means "brush-net fishing." These brush-nets were undoubtedly weighted with the notched pebbles, correctly called net-weights or net-sinkers.

Hammers.—These implements, rounded, with slight depressions on each side, are abundant. A few without the cavities were also picked up. With few exceptions they were all water-worn pebbles. The exceptions were yellow or brown jasper. These, I think, can be said with truth, came from the extensive jasper quarries near Vera Cruz or Macungie, eight and ten miles South and West from this city. I have so far not seen pitted jasper hammers and it is curious to note that of the series of hammer-stones picked up by Mr. H. C. Mercer and the writer at the extensive quarries near Macungie, not one showed depressions. The greatest number were water-rolled stones.

Grooved Axes.—The writer found a few of this style of implement. Others have been more successful. One to me very interesting specimen is a large, flat, thin piece of stone, broken from a water-worn boulder, with two notches, one on each side, where the groove should have been. Then a slight show of chipping to shapen the blade about three inches wide at its cutting part, was all the work done on it. The others found here were similar in form to those taken from the ground in every section of the United States. Polished specimens have never been found.

UNGROOVED AXES.—Two were added to my collection from this island. A description of them is unnecessary, for they showed no peculiarities.

ADZES.—An implement very rare here. Five were however given to the writer by a friend who picked them up on the island.

KNIVES.—The implement found with the female skeleton belongs to this class. I have also found numerous leaf-shaped and other chipped relics which I have termed knives.

SCRAPERS.—This interesting implement is found here in two forms—the "sheaf-of-wheat" pattern, so called by Dr. Abbott, and the "horse-shoe" and "kite-shaped" forms described by Sir John Evans. Of the two shapes mentioned last I have some very fine examples and they closely match some of the European forms in my cabinet. Although I own a number of the "sheaf-of-wheat specimens, none have been obtained by me from the island. I place with this form a lunar shaped object made from black jasper and beautifully chipped. Imagine an almost true circle, one and three-eighths inches in diameter, from which has been roundly chipped one-quarter of it and you can conceive what the relic looks like. There are on its sides no notches, else would I believe a handle had been fastened to it. I have also obtained scraper like objects with battered edges. These were perhaps used in producing sparks to build fires. Here might also be mentioned a square, flat, jasper object, nicely chipped, of the same size as "gun flints," which I am certain served the same purpose.

GORGETS.—One rudely made gorget, three inches long and one-half wide, with two large funnel-shaped perforations, one inch apart, was picked up by the writer.

CEREMONIAL WEAPONS.—Of all relics taken from the surface of the island these are the rarest. I was fortunate finding but one, and this instead of the usual perforation through the center, had a single groove on one side. It is made of slate, without polish, three inches long, two wide, both wings taper to one inch wide, to what might be termed the cutting edge.

PESTLES.—These objects have only been discovered in parts. Just enough of them to know for what purpose they were once used.

Polishing tools were found in several instances.

Implements, the use of which is unknown, have here, like on other camping sites, too made their appearance.

SPEAR-HEADS.—Found but few and of such forms that they may have served just as well for skinners or knives.

DRILLS.—A few of these rimming tools have been found. They have the tang of the arrow-head but the body is long and slender.

ARROW-HEADS.—Of all implements this is found in greatest numbers and every form is represented. While many are rudely made, one can often pick from the surface arrows that compare favorably with the most beautiful chipped objects from the South or West. A very rare arrow is the tanged leaf-shaped form, so called by the late Dr. Charles Rau, who in acknowledging the receipt of one sent him by the writer, said that it was the only relic of this shape then in possession of the Smithsonian Institution. It is shown on Plate 1, Fig. 3, opposite page 102 in Smithsonian Report, Part II, 1886. Imagine an elongated leaf-form having a flaring tang or base, indented, and the reader will be aware of the form of this rare specimen. The writer knows of but a few in the possession of other collectors and all were found in the Lehigh Valley.

Although the island abounds in chips and flakes of jasper and other minerals, proving that some of the relics were finished on it, there are reasons to believe that many were washed there during high water. The writer has, after such occurences, gone over the ground washed by such freshets and found numerous implements. Many of the relics have also been obtained by men who have for a number of years been digging and washing sand for building purposes, but were lost by them or given away—the fate of so many stone objects.

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EDITORIAL.

What excuse have the publishers for imposing upon an already burdened public another magazine, is perhaps the question that will be asked by those into whose hands this venture will fall.

It has, for some time, been admitted by many of the ablest archæologists that a primer-like journal should be printed by some one; but up to the present none have undertaken it.

Nowadays nothing is begun unless with an assured promise that in the venture there should be a money profit, and a pretty good one at that.

The writer can truthfully assert right here that in this case is the profit part of this attempt a secondary consideration. Its publishers know very well that instead of a profit accruing it will be nearer to being out of pocket.

And what of the editor? His solace and pay will be to know that the trials and troubles which he has imposed upon himself will be lightened by the knowledge that what he is doing for the edification of his readers will be appreciated.

We desire to educate the curiosity seeker so that he will become a student of the ennobling science of archæology: to make of him a scientific collector seeking to know all about the objects of which he becomes possessed.

Our aim also is to prevent collectors —for they will purchase relics—from being imposed upon by unscrupulous dealers and knaves who can be found in many parts of the United States and elsewhere counterfeiting every known form of prehistoric object. To this class of individuals we will give considerable of our time. We want to, and it can be done if collectors will aid us, prevent "Flint Jacks" from plying their nefarious business.

It is understood that this magazine is to educate the beginning collector. We want, therefore, to hear from all such. We wish correspondence on the subject. Such letters will all be published. Questions asked will gladly be answered in every number of the journal. Any matter of archæological value sent to the editor will receive attention. Do, therefore, not hesitate to tell us of discoveries made: of curious objects found. You can all aid us in making a success of this undertaking.

BOOK REVIEWS.

PRIMITIVE MAN IN OHIO, by Warren K. Moorehead: pp. xv—246, 8mo., 1892. G. P., Putnam's Sons, New York.

This young archæologist, perhaps it were best to call him an anthropologist, has jointly given to the anthropological world another very interesting book. His partners in its production are Mr. Gerard Fowke, Dr. H. T. Cress, and Mr. W. H. Davis. The author in his preface wishes his readers to know that only those who have done field work, "those who have endured the rains of spring, the heat of summer, the chilly snows and sleet of winter, living in their tents or barn-like sheds along the tumuli that must be studied inch by inch with pick and shovel, have a right to cry out in honest indignation when the reports of men who have never thrust a spade into the structures they attempt to describe have been conclusive on the subject."

The "carpet knight" who is always a student and often knows a thing or two, then, is to remain silent, especially so when he wishes to combat theories formed by the workers in the fields.

Mr. Moorehead's rule to "note everything" appears to have been carefully adhered to in the excavations of the many mounds, graves and cemeteries during four sessons of work, which action places the book on the list of authorities.

Chap. I treats of Palæolithic man in Ohio.

Chap. IV describes "Flint Ridge" and other spots from which was taken the material used in making the flaked implements handled by the aborigines.

It is claimed by the writer that like this there is no other place in the United States as large. Since this was written have been examined the jasper quarries at Macungie, Lehigh Co., Penn., which cover a larger surface.

The greater part of the book is devoted to the opening of mounds, unearthing of skeletons with accompanying implements of stone, bone, copper, etc., and is embellished with numerous plates and figures.

A most interesting chapter to the archæologist is a description of the discovery in one of the Hopewell mounds of 7,232 flint discs. These, when placed on the ground, covered a space of fifteen by eight by three feet. They weighed nearly 6,800 pounds and it took four horses to draw them.

Mr. Moorehead concludes from observations, that in pre-historic times lived in Ohio, or that part of country now within its bounaries, two savage races of men, those with long heads and those having short heads. That those with long heads were a combative people, and relentless foes of the short-headed, peaceable race: that they reached only the condition in which were found of the red Indians, and were an antochthonous, original people, the American race.

He further observes that many of the crania and skeletons unearthed by him were like unto those of the negro in anatomical characteristics. Taken as a whole the book is worthy of the space in any scientific library.

A. F. B.

NOTES.

Prof. Angelo Heilprin says that the most primitive type of men on this continent are the Eskimos of Whale Sound. There are two hundred and thirty-three of them in all, and they are, in all probability, of the same stock as the famous cave-dwellers.

* * *

At the opening of the International Congress of Archæology, at Moscow, Professor Virchow reported in his address, what he previously said, that no trace of "the missing link" between man and the lower animals has been discovered, either in human skulls that are believed to be the most ancient or in the physical organization of the modern savage.

* * *

Mr. Thomas Ewbank tells us in his paper on "Illustrations of Indian Antiquities and Arts," to be found in Pacific Railroad Reports, Vol. 3, Part 3, p. 47, in which he gives illustrations "as axes having grooves only on three sides. They were obviously used without a handle. In what manner then were they used? The answer was given by four Ojibway Indians, part of a delegation—1858. While drawing up this paper they paid me a visit and at once explained that the grooves were for the thumb and forefinger. The grooves prevent the instrument from slipping out of the grasp."

* * *

Origin of Spoons.

Two natural objects seem to have furnished the model for the spoon to primitive man—the river or seashell and the leaf of plants. In southern China shell spoons are still used that are closely reproduced in the familiar procelain spoons of that country, while metal spoons are found in India on which are reproduced even the veins of the leaves from which they were copied.

* * *

The Making of Gun Flints.

It is rather startling to learn, on the authority of P. A. Graham, in Longman's Magazine for October, that gun flints are still an article of commerce. So far from breechloaders and percussion caps having destroyed the industry, the flint lock trade has revived and is now more flourishing than it has been for some time. Flints used to be exported chiefly to Brazil and South America, but now they go for the most part to South Africa. There is a colony at Brandon, Eng., of hereditary flint knappers. Each knapper makes about 3000 gun flints in a day.

* * *

Antiquity of Death Masks.

Although there is no mention of death masks in the works of Homer, or in any of the later classics, recent explorers have satisfied themselves that in the early burials of all nations it was the custom to cover the heads and bodies of the dead with sheets of gold so pliable that they took the impress of the form, and not infrequently, when in the course of human centuries the embalmed flesh had shriveled or fallen away, the gold retained the exact cast of the features. Schliemann found a number of bodies "covered with large masks of gold plate in repousse work," several of which have been reproduced by means of engraving in his "Mycenæ," and he asserts that there can be no doubt whatever that each one of these represents the likeness of the deceased person whose face is covered.

* * *

A Valuable Hindoo God.

The famous Hindoo god Lingam is now owned by an English gentleman of culture, who paid a sum equal to $13,000 for it at an auction sale of East Indian relics in 1888. This sacred image stands but twelve and one-half inches high, but small as it is, it is well worth its weight in first water diamonds. The base of the figure is of pure hammered gold, and around it are set nine gems—a diamond, ruby, sapphire, chrysoberyl, cat's-eye, coral, pearl, hyacinthine, garnet, emerald, and moonstone. The apex of the figure, which is in the shape of a pyramid, is encircled with a plinth set with small but very fine diamonds. The pinnacle of the pyramid is a topaz one and ten-sixteenth inches in length and nine-sixteenths of an inch in depth, this in shape of a horse shoe, the center being a cat's-eye of exceeding brilliancy. When the "Bad Shah," last King of Delhi was captured and exiled to the Andaman Islands his Queen secreted this idol and it was never seen again until recent research brought it to light, whereupon it was taken to London and disposed of to Mr. Spencer, as above related.

* * *

Rings and Tree Growths.

The co-relation that was for a long time supposed to exist between the number of annular (?) rings formed in the trunk and the age of trees has been refuted on the best of evidence. M. Charency, the French explorer, who visited the ruins of Plenque, Mexico, in 1859 and again in 1882, found after a lapse of twenty-two years that trees which had been cut by him in the first-named year had in the short interval of less than a quarter of a century grown new trunks which exhibited no less than 230 of these so-called "annular rings!" According to this evidence, which is undisputable, these trees made at least ten "annualar" rings every year. M. Boussenard, another French savant of international reputation, says: "It would appear from the best evidence which I have been able to deduce, that trees and plants of tropical countries often form no less than twelve concentric growths in the space of a single year, two of which are more plainly marked than the others, they appear to correspond to periods of maximum circulatory activity." In the light of these opinions are rings a guide to tree growth?

* * *

Relics of the Mound Builders.

The Bones of Buffaloes and Human Beings Unearthed in New Jersey.

PLAINFIELD, N. J., Oct. 23.—George H. Fountain unearthed, last week, in excavating in the western part of the city, the complete skeleton of a large animal. He took parts of it to Columbia college, where Prof. Bean pronounced the bones to be those of a buffalo. Mr. Fountain's find is looked upon as a very important one, inasmuch as this is the first time the bones of the baffalo have been found east of Erie, Pa. He has been excavating in this locality for some time, the peculiar formation leading him to believe that it was at one time the home of the mound builders. He has found the peculiar formation characteristic of these old monuments and the remains of carefully laid pavements. He has taken from the mound skulls and other human bones and many peculiar instruments of war. This is the only trace of the mound builders in New Jersey.

Mr. Fountain, if the above is true, no doubt came across the remains of an Indian Buffalo feast, and the exageration of this discovery into the home of the Mound Builders, who never came to New Jersey, is the idea of some "Joe Mulhatton" newspaper reporter, of which I am sorry to say, this earth of ours holds too many. ED.

The Grave of an Indian Chief.

Notable Relics Found Near Newmanstown, Pa., by G. A. Dewees.

G. A. Dewees, living near Sheridan, Pa., discovered an Indian grave, back of Newmanstown, in which he found a number of relics. Among them were; A wrought-iron tomahawk in splendid condition, with spike at one end, a finely polished stone pipe, a splendid specimen of a portion of a meteor, jaw-bone with teeth, and other articles. These effects are supposed to have belonged to an Indian chief. Mr. Dewees says he has located the graves of eight other Indians and will explore them later. The Indian is believed to have been buried over 150 years ago. The spot is near the line of Berks, Lancaster and Lebanon counties.

EXCHANGE DEPARTMENT.

Exchange notices pertaining to archæology, not exceeding 35 words, will be inserted free for all regular subscribers.

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ONE copy of Geological and Geographical Survey of Colorado, 1873, contains valuable information for geologists. Will exchange for Indian relics. Make offers. Geo. J. Remsburg, Atchinson, Kan.

250 ARROWHEADS for sale at a bargain. Price only $5. C. E. Tribbett, Thorntown, Ind.

We shall consider it a great favor if our readers will kindly send us the addresses of those interested in archæology residing in their vicinity.

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the needs of savage life ever to have been discarded by the North American in his stone age.

On the other hand we may ask the important question, whether the process was not too simple and rudimentary ever to have been preceeded by any other process.

If there was a time when man first chipped one stone with another—and who can deny it?—how shall we imagine him proceeding straightway to make an implement at ten blows, when he got one at one, making a "paleolith" before he knew that the first chip therefrom would cut? And can we easily help regarding this chip-knife next only to the hammer-stone that made it, as the type of the most venerable of all stone implement, the first cutting tool of stone fashioned by the hand of man to arm himself for his early conflict with the forces of nature.

In a word supposing the first comer to the shores of the Delaware to have been paleolithic man, it is not easy to see how he could have avoided making specimens like these.

But these flake-knives, we may infer, were not always chipped from large boulders.

Take a smaller pebble and knock a few chips from it, for the same purpose. Have you not in the act hit upon another way of accounting for certain of the forms from Trenton? And are you not driven to seek for some clew outside the shape of your specimen, in attempting to assign for it a relative age?

Now we know that these particular flake-knives and cores are as modern as pottery and net-sinkers, in the sense that the specimens from the Durham and Flint Ridge quarries are modern, and that those from Piney Branch, which they resemble, are modern; and let us find, as I have found, "paleoliths" or "turtlebacks" of argillite, sandstone, quartzite and jasper, which may be classed as modern "failures," "blocked out blades" or knife material as the case may be, on the Delaware at Point Pleasant, Ridge's Island, Gilmer's Island, Hickory Run, Gallows Run, and Upper Blacks Eddy, but by no means, let us push the inference too far, for what proof or even probability is there that precisely similar objects are not to be found in a deeper geological horizon in the same valleys where disassociated with tokens of the later Indian, they represent the work of men preceding him by thousands of years?

What if the so-called "paleolithic" form must be finally given up as a type! What if it represents no particular period whatever in the past of the American stone age!

Once forced, as we are, to admit that a man of the River Drift had he existed, could hardly have avoided chipping stones like these, we realize that there are years of careful search ahead of us, that there are scores of sand pits, railroad cuts, wells and falling banks to be closely examined, that there are thousands of dollars to be spent in the days' wages of laborers digging trenches on the shores of the rivers that drained the great glacier, before we venture to conclude and be positive. Since the one thing which can finally identify such stones as "paleolithic" or settle their relative age beyond a doubt, is not their shape, or waterworn appearance, their association or disassociation with supposed later Indian remains, or their classification with flake-knife material or half finished blades whether at Durham, Flint Ridge, or Piney Branch, but their stratographic position.

A PRE-COLUMBIAN DINNER.

[By Permission of Author.]

A ponderous geologist, with weighty tread and weightier manner, brought his foot down upon the unoffending sod and declared, "These meadows are sinking at a rapid rate: something over two feet a century." We all knew it, but Sir Oracle had spoken, and we little dogs did not dare to bark.

Not long after I returned alone to these illfated meadows and began a leisured, all-day ramble. They were very beautiful. There was a wealth of purple and of white boneset and iron weed of royal dye. Sunflower and primrose gilded the hidden brooks, and every knoll was banked with rose-pink centaury. Nor was this all. Feathery reeds towered above the marsh, and every pond was empurpled with pontederia and starred with lillies. Afar off acres of nut brown sedge made fitting background for what meadow tracts were still green and grassy, while close at hand, more beautiful than all, were struggling growths held down by the golden dodder's net that overspread them.

It does not need trees or rank shrubbery to make a wilderness. This lowlying track, today, with but a summer's growth above it, is as wild and lonely as the Western plains. Lonely, that is, as man thinks, but not forsaken. The wily mink, the pert weasel, the musk-rat and meadow mouse ramble in safety through it. The great blue heron, its stately cousin, the snowy egret, and the dainty least bittern find it a congenial home.

The fiery dragon-fly darts and lazy butterflies drift across the blooming waste: bees buzz angrily as you approach: basking snakes bid you defiance. Verily, this is wild life's domain and man is out of place.

It was not always so. The land is sinking, and what now of that older time when it was far above its present level—a high, dry, upland track along which flowed a clear and rapid stream? The tell-tale arrow point is our guide, and wherever the sod is broken we have an inkling of Indian history. The soil, as we dig a little deeper, is almost black with charcoal dust, and it is evident that, centuries ago, the Indians were content to dwell here, and well they might. Even in Colonial days the place had merit, and escaped not the eager eyes of Penn's grasping followers. It was meadow then, and not fitted for his house, but the white man built his barn above the ruins of his dusky predecessor's home. All trace of human habitation now is gone, but the words of the geologists kept ring in my ears, and of late I have been digging. It is a little strange that so few traces of the white man are found as compared with relics of the Indian. From the barn that once stood here and was long ago destroyed by a flood it might be expected to find at least a rusty nail.

The ground held nothing telling of a recent past, but was eloquent of the distant long ago. Dull, indeed, must be the imagination that cannot recall what has been by the aid of such material as the spade here brought to light. Not only were the bow and spear proved to be the common weapons of the time, but there were in even greater abundance, and of many patterns, knives to flay the game. It is not enough to merely glance at a trimmed flake of flint or carefully chipped splinter of argillite, and say to yourself, "a knife." Their great variety has a significance that should not be overlooked. The same implement could not be put to every use for which a knife was needed: hence the range in size from those of several inches in length to tiny flakes that will likely remain a puzzle as to their purpose. It is supposed and possibly asserted that the Indian knew nothing of forks, but that he plunged his fingers into the boiling pot or held in his bare hands the steaming joints of bear or venison is quite improbable. Now, the archæologist talks glibly of bone awls whenever a sharpened splinter of bone is presented him, as if only to perforate leather were such implements intended. They doubtless had other uses, and I am sure more than one split and sharpened bone that was found would have served excellently well as a one-tined fork wherewith to lift from the pot a bit of meat. Whether or not such forks were in use, there were wooden spoons, as a bit of a bowl and mere splinter of the handle served to show. Kalm tells us they used the laurel for making this utensil, but I fancied my fragment was hickory. Potsherds everywhere spoke of the Indian's feasting, and it is now known that, besides bowls and shallow dishes of ordinary sizes, they had huge vessels also, of several gallon's capacity. All these are broken now, but, happily, fragments of the same dish are often found together, and so we can reconstruct them.

But what did the Indians eat? Quaint old Gabriel Thomas, writing about 1696, tells us that "they live chiefly on Maze or Indian Corn roasted in the Ashes, sometimes beaten boyl'd with Water, called Homine. They have cakes, not unpleasant; also Beans and Pease, which nourish much, but the Woods and Rivers afford them their provision; they eat morning and evening, their Seats and Tables on the ground."

In a great measure this same story of the Indians' food supply was told by the scattered bits found mingled with the ashes of an ancient hearth. Such fireplaces or cooking sites were simple in construction, but no less readily recognized as to their purpose. A few flat pebbles had been brought from the bed of the river near by and a small paved area, some two feet square, was placed upon or very near the surface of the ground. Upon this the fire was built, and, in time, a thick bed of ashes accumulated. Just how they cooked can only be conjectured, but the discovery of very thick clay vessels and great quantities of fire-cracked quartzite pebbles leads to the conclusion that water was brought to the boiling point by heating the stones to a red heat and dropping them into the vessel holding the water. Thomas, as we have seen, says corn was "boyl'd with water." Meat also was, I think, prepared in the same manner. Their pottery probably was poorly able to stand such harsh treatment, which would explain the presence of such vast quantities of fragments of clay vessels. Of traces of vegetable food none are now to be found, except very rarely. A few burnt nuts, a grain or two of corn, and, in one instance, what appeared to be a charred crab apple completes the list of what as yet have been picked from the mingled earth and ashes. This is not surprising, and we know of vegetable food in use among the Delaware Indians is almost wholly derived from those early writers who were present at their feasts. Kalm mentions the roots of the golden club, arrow leaf and groundnut, besides various berries and nuts. It is well known that extensive orchards were planted by these people. It may be added that, in all probability, the tubers of that noble plant, the lotus, were used as food. Not about these meadows, but elsewhere in New Jersey, this plant has been growing luxuriantly since Indian times.

Turning now to the consideration of what animal food they consumed, one can speak with absolute certainty. It is clear that the Delawares were meat eaters. It needs but little digging on any village site to prove this, and from a single fireplace, deep down in the staff soil of this sinking meadow, have been taken bones of the elk, deer, bear, beaver, raccoon, muskrat, and gray squirrel. Of these the remains of deer were largely in excess, and as this holds good of every village site I have examined, doubtless the Indians depended more largely upon this animal than upon all the others. Of the list only the elk is extinct in the Delaware Valley, and was probably rare even at the time of the European settlemant of the country, except in the mountain regions. If individual tastes varied as they do among us we have certainly sufficient variety here to have met every fancy. Not one of the animals named but is considered eatable among ourselves, although raccoon is scarcely a delicacy. Eyebrows may raise at the suggestion of dining on muskrats: but he who has had their hind legs properly cooked knows what a royal dish they make. Prominent among the bird-bones were those of the wild turkey, but traces of smaller game were found. The turkey has been extinct on these same meadows less than one hundred years. Fish of many kinds have been recognized from the scattered bones, jaws, with teeth and spines, and seldom is a fireplace exposed but the large, horny plates of the sturgeon are found. It is said that these were used as knives, their edges being made sharper by grinding. It is very likely, and knives of jasper, of just such shape and size, are not uncommon. Of course, the Indian well knew the merit of our oysters, as the huge shell-heaps on the sea-coast testify, but here he was content to use our river mussels, and with proper seasoning they can be made palatable. I have known one to be worried down, backed by a wad of pepper-grass. Mussel shells, like sturgeon scales, were also used as knives.

With a food supply as varied as this (and nothing whatever has been surmised), an ordinary meal or an extraordinary feast can readily be recalled, so far as its essential features are concerned. It is now September, and save where the ground has been ruthlessly uptorn, everywhere is a wealth of early autumn bloom. A soothing quiet rests upon the scene, bidding us to retrospective thought. Not a bit of stone, of pottery or a burned and blackened fragment of bone but stands out in the mellow sunshine as the feature of a long forgotten feast. As I dreamily gaze upon the gatherings of half a day, I seem to see that ancient folk that once dwelt in this neglected spot; seem to be a guest at a pre-Columbian dinner in New Jersey.

Charles C. Abbott, M. D.

Museum of American Archæology, University of Pennsylvania.

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AMERICAN ANTIQUITIES AT THE WORLD'S COLUMBIAN EXPOSITION.

According to the latest advices received from headquarters, the plan of the exhibit of department "M" in 1893 is fully settled. Prof. Putnam, chief of the department, accompanied by the United States Commissioner of Indian Affairs, recently conferred with the Director General as to the location of the ethnographical exhibit and of the building which the government is to erect for the purpose of carrying on an Indian school during the fair. It is arranged that this department include in its exhibit of American peoples, the Indians of the United States; and that our government represent its method of educating and civilizing them. The collections—archæological, ethnological and historical—are to be exhibited in the north end of the main building—i. e., the building of manufacfurers and liberal arts. There they will occupy four acres of floor space, and will be classified in a series of alcoves.

The American ethnographical exhibition will be out in the open air, not on Wooded Island, as this was given up to horticulture. but on the borders of the lake. Here will be seen the natives of Vancouver's Island, in their queer long boats drawn up ashore, or in and about their curious plank houses, performing their feats of jugglery and going through their peculiar ceremonies; also the several tribes of North American Indians, each in its native dwelling: whether it be the wigwam of skins, the house of poles, or the little mud hut. Here further will be seen the Maya from Yucatan, making his baskets and pottery vessels, and the native of Guatemala making their laces and woven fabrics. Besides these there will be represented the various tribes of South America, including those of Terra del Fuego, about whom we know so little. All these native peoples, dressed in their own peculiar costumes and adorned with their odd ornaments, will be surrounded by their characteristics, household furnishings, etc., and will be carrying on their native industries during the exposition.

The archæological exhibit, the location of which has been mentioned, will well represent the ancient people or the New World. There will be exhibited some of the rude palæolithic implements found in the Trenton gravels. These are supposed to be the remains of that most ancient American race which lived contemporaneous with the mastodon at the close of the glacial period. The remains of that later people, called by some the "Mound-builders," will be of great interest. Prominent among the relics of this race will be the collections made by the exploring parties sent to Ohio during recent years by the Peabody Museum of Cambridge, Mass., and the World's Columbian Exposition. All of these explorations have been under the direction of Prof. F. W. Putnam, of Harvard University, curator of the Peabody Museum, and now chief of Division "M."

Besides all these specimens, and to the scientific world very important, there will be shown relief maps of the great Serpent Mound, of Adams County, Ohio: Fort Ancient, the Cahokia Mound, and other similar earth-works of the Mississippi Valley.

There will be exhibited the remains of that wonderful civilization of ancient Yucatan. The representation of the ruined buildings of this civilization will be of the greatest interest to many of us. Not a few of these buildings were constructed of large blocks of stone, which in our day we would not think of moving without the assistance of the most improved of modern machinery: and all these blocks are carved into beautiful interwoven designs, which continue from one stone to another with perfect regularity. One of the ruins—the "Portal of Labna"—will be reproduced in terra cotta, and will form the entrance to the outdoor exhibit. The wonderful sculpture and idols from the ruins of Copan will be another interesting feature. The casts of the hieroglyphics on the ruins of Palenque, rivaling the ancient writings of the orient, will be scarcely less marvellous. Passing then to the ancient civilization of Peru, what will there be of greater curiosity than the remains of the

Inca nation? Among the Peruvian specimens will be seen pottery vessels of every description represented upon which are the various forms imitative of animals of every kind, from the lobster to the human being. The mummies, of which this department has succeded in obtaining over one hundred specimens, will be of use for comparison with the better known Egyptian remains. Although these are wrapped in finely woven frabrics, the bundle and external appearance would readily distinguish them from their Egyptian brothers.

In addition to the various remains, there will be hundreds of photographs, taken by the expeditions, of mounds and ruins in all parts of this "new old world," from Alaska to Terra del Fuego. And not only photographs, but also maps, charts, and diagrams will be shown to illustrate the localities, the comparisons of different races, their migration and development.

Work was recently commenced on a new section of this division. It is to include primitive religions, games and folk-lore. And under this section will be exhibited, as far as possible, objects illustrating all the early religions. Prominent among these specimens will be seen the strange idols, such as are now being collected by the Peabody Museum Honduras Expedition, and some of those most peculiar clay alters containing cremated human bodies, such as were found in the famous Turner Group of Ohio. Besides such specimens, there will be an almost endless series of amulets, totems, charms and other objects illustrative of fetish or religious rites.

Exhibits are to be made of the various games of all countries: and of the gaming accessories, such as cards, dice, dominoes, chessmen, and the peculiar objects used by savage races. These objects will be arranged to trace the origin and development of the games in different parts of the world. This feature will doubtless be of great interest to the public in general as well as to the followers of Hoyle.

Under the group, "Isolated and Collective Exhibits," the department will include numismatic, zoological, geological and natural history collections in general. But only specimens having a high scientific and educational value will be accepted by the department.

The coin collector will find much to interest him in the coins and medals of the world: and the historical student will find that a series of coins of the various issues, has much to teach him of the progress of civilization. Taxidermists will see samples of the finest work in their line.

Arrangements are being made with the several states to place their historical exhibits under this department, as it is thought by Prof. Putnam that if these relics of the past are placed in their relative positions and with some attention to a geographical arrangement, they will have a much greater educational value, and visitors will then be able to draw important object lessons of the geography and history of the states as individuals and also as a part of the whole country much better than if the historical specimens were isolated in the state buildings.

The plan of this section, similar to that of the entire department, is to show the true bearing of these studies upon a general education and to inspire an intellectual interest in them.

Such are the plans of the department, the results of which the increasing interest and untiring efforts of Prof. Putnam can not fail to materialize. One immediately conceives that this exhibition will afford many of the advantages of travel and research, and will be one of the most interesting features of the exposition.

HARLAN I. SMITH.

Saginaw (E. S.), Michigan.

THE ARCHAEOLOGIST.

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CORRESPONDENCE.

ED. ARCHÆOLOGIST:

About twenty years ago my brother found a stone standing upright in a small mound in a large piece of woods. The mound was situated on the banks of a creek. The stone was about twenty inches long, three wide, and about two and one-half inches thick in the center, but became thinner toward each end, where they were about one inch thick. The object was of a hard stone and had been worked to its present shape. It was taken to a local collector who said it marked the site of an Indian grave. This happened some years after it was found, and all trace of the mound was lost. Have others found such relics? I would like very much to know. The same locality has produced many celts, drills, arrows and other implements. While plowing near here a few years ago, a farmer turned up a large black arrow—spear or knife perhaps,—a round, smoothly wrought stone, three inches in diameter, and a ceremonial object with two perforation. This is exceedingly well made, being very smooth and symmetrical. It is about three and one-half inches long, flat on the bottom, rising to a peak at the centre where it is about one inch high. The perforations are countersunk from each side. All three of the articles are now in my collection.

F. C. DEAN, Lowville, Pa.

* * *

ED. ARCHÆOLOGIST:

Flowing near my home at Oxford, Ohio, is a creek called by the Indian name of Talawanda. I spent many pleasant days along the banks of this stream collecting relics. My favorite locality is about three miles distant, just below Lane's Mill. The east bank is between eighty and one hundred feet high, and the bottom part from the creek bed to about twelve feet high is glacial drift, and thence upward is gravel drift. On the top and close to the edge were two small mounds about seventy-five or one hundred yards apart. One has disappeared entirely, and the other is about one third destroyed, washed away. In company with a student I opened the remaining mound about ten years ago: in which we found a skeleton lying north and south. At the west edge of the mound we found a few ornaments and two beautiful spear heads. Later was taken out a small piece of pottery identical in every respect with some procured from Costa Rica, Central America, which antedates the occupation of that country by the Spaniards. At the same time was found in the mound a perfect Orthis Linuata, which shows that the Mound Builders must have carried the ground from a Silurian hill that protrudes up through the glacial drift to within about sixty or seventy feet—vertically—from the top. At that time they must have gone several hundred yards to get the Orthis, unless it was put in as a relic, which is hardly probable.

Imagine, if you please, a number of men of our race and our day carrying all the ground required for this mound, in rude baskets, bags made of skin, or perhaps pieces of bark, or flat stones. D. A. McCord, Oxford, O.

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Ed. Archæologist:

I have just returned from a collecting tour down Powell river.

Among the many things secured was what we call a bow-string twister, given me by Mr. Andrew Fitz, who found it in a burying ground, just back of his chimney. It is canoe shaped, five inches long, with an oval cavity worked out of it along its centre. At each of the ends is a perforation. Carvings are cut on top and side. I call it by this title for want of a better name. Will readers of The Archæologist give it a name more suitable?

G. W. Robinette.

BOOK REVIEWS.

Manners and Monuments of Prehistoric Peoples, by the Marquis De Nadaillac: translated by Nancy Bell. G. P. Putnam's Sons. New York. 412 p. 8 vo. $3.00.

This volume is the second production by an author who stands high in European archæological circles. While it contains but little relating to Prehistoric America, and this only for comparison, the whole book is filled with the most interesting matter relating to the doings of Europe's Prehistoric inhabitants: especially so during that long period called the stone age, of which the neolithic or polished stone age is, however, a mere drop in the ocean of time as compared with the vast duration of the palæolithic or rude stone age.

In Chap. I. we are told of discoveries made of stone objects during the last and the early part of the present century. He tells us how men who claimed to have found these implements made by human hands, were frowned down and their finds treated with indifference and contempt.

In 1826 a French scientist, named Boucher de Perthes, first published an opinion, and in 1847 announced his discovery of worked hatchet like flints, near Abbeville, his home, in the alluvial deposits of the river Somme. Although for twenty years he contended heroically against the indifference and attacks of men of science, he had, before his death, the extreme pleasure of seeing at his feet the very savants who were his most powerful opponents. Justice to him came at last, and today de Perthes is recognized in the archæological world as the first discoverer of vestiges of man who lived in an age when the present outlines of the eastern continent were not yet founded.

There is now living in the United States an eminent archæologist who is having a similar experience. To him too will justice be done before many years have passed.

Chap. II. tells of the manner of hunting and fishing during that distant age: of the discoveries of boats and dugouts. Not alone were wild animals and fish eaten, but human flesh was also consumed.

Chap. III. treats on weapons, tools, pottery, origin of fire, clothing, ornaments and early artistic efforts. This subject is the most interesting part of the chapter.

Chap. IV. describes graves, kitchen-middens, lake-stations and towers of stone.

The Megalithic or large stone monuments to which Chap. V. is devoted is a learned story of these tombs, for such they appear to be, which are to be found "from the shores of the Atlantic to the Ural mountains; from the frontier of Russia to the Pacific ocean, and from the Steppes of Siberia to the plains of Hindustan."

Chap. VI. treats on industry, commerce, social organization, fights, wounds and trepannation.

Chap. VII.—Camps and fortifications: of the towns of Hirsarlik, Schlieman's Troy, and the many discoveries there of pottery, copper, gold, and silver objects.

Chap. VIII. treats on tombs and menner of burial.

The volume turns with fine illustrations is worthy of place in any library and no archæological student should be without it. A. F. B.

NOTES.

Several years ago in an article in Plain Talk, then the organ of the American Archæological Association, the writer asserted that broken or imperfect prehistoric relics should not be restored with material foreign to the implement. He insisted that any person doing this showed a want of proper archæological training, and innocently connived at producing objects which rightfully might be called frauds. This was gainsaid by a collector living in the western part of Pennsylvania, who claimed he could see no wrong in doing this. The writer believes that this manner of restoring relics is theoretical, which is wrong. This not being right should not be attempted for in after years the objects may go into other cabinets as true objects of Indian art: and here is the beginning of injury. To prove that the statement holds true is but to say that a short time ago was shown the editor by Dr. C. C. Abbott, a ceremonial weapon so restored. It took a second glance to notice where began the restoration which was done exceedingly well. It was produced by one too, who, as a maker of frauds, has become somewhat notorious. Who would want in his collection an object of this kind? The writer believes in repairing relics when all the parts are present, but never cares to see restored objects, for they are valueless in a collection.

* * *

The Shawnee's Mound Builders.

Prof. Cyrus Thomas of the Bureau of Ethnology, Washington, D. C., attempts to show that the Shawnee Indians were habitual Mound Builders, and kept on raising mounds after the arrival of the Spaniards or Europeans. He says that one of the great mounds at Etowah, Georgia, was raised by these Indians. In it were found a number of copper plates, which bear evidence of once having belonged to white people. Dr. D. G. Brinton tells us that they came as far north as Pennsylvania. Several archæologists also believe that they are the authors of the stone graves, because this mode of burial is only found where waned the Shawnees.

* * *

Stone Anvils.

In the same museum are a number of large stone objects, some only partly flaked, which have been termed stone anvils. Others have called them busts. The finest object in the lot is wholly chipped into shape, and has a very anvil-like appearance. It is really a fine piece of aboriginal workmanship. They were found in the northern part of Bucks county, eastern Pennslyvania, and were first brought to the notice of archæologists by the Rev. J. G. Dengler, of Seller.-ville, Penn. They were perhaps made use of in ceremonial customs.

* * *

Gold Beads.

In the archæological museum belonging to the University of Pennsylvania are a number of virgin gold beads, one half inch to one inch long, fashioned into an oval shape, and nicely wrought and polished. A great amount of the precious metal must have been lost in their production. They were taken from a mound in Florida, and the metal from which they were made, probably came from Georgia. The gold mines in that state are worked at the present time.

* * *

Brass Beads.

Still another interesting object is a quantity of brass beads. Their discovery can certainly be called unique. They were chopped, last summer from the trunk of a tree, by a wood cutter in the upper Delaware valley, and were procured for the museum by Mr. H. C. Mercer, one of our contributors.

* * *

Stone Axes Used as Currency.

The editor quotes from "The American Anthropologist", Vol. vi, No. 1, p. 84, the following interesting note:

"Although the native canoe builders in the Louisiade Archipelago, British New Guinea work with adzes made of hoop-iron, the payment for their work is made in stone axes: ten to fifty of these being the price of a canoe. The stone axe is still the accepted medium of exchange in large transactions—pigs for instance: and wives are valued in that currency. It is only fair, by the way, to mention that the purchase of a wife is stated by the natives not to be such in the ordinary sense: the articles paid are, they say, a present to the girl's father. In Mowatta, sisters are specially valued, as they can be inter-changed with other men's sisters as wives. Trotter in Proc. Roy. Geog. Soc., P. 795, Nov., 1892.

* * *

Blow Guns.

The blow guns used by the savages of Guiana for shooting poisoned arrows are very wonderful weapons, indeed. The climate of this equatorial region being both very hot and very moist, produces a vegetation of astonishing luxuriance. The forests are commonly ankle deep in water for mile after mile, and, consequently, the animals found there mostly inhabit the trees. Monkeys are exceedingly numerous. For killing these tree-dwelling creatures the blow gun is the best possible instrument. It is made from a peculiar kind of reed, and, although eleven or twelve feet in length, its weight is only a pound and a half. It is provided, like a rifle, with a fore sight and a back sight, the latter being made of the teeth of a small beast called the acouchi.

The natives are most careful respecting the straightness of their blow guns, and never allow them to lean against anything lest they should be warped. The arrows employed are made from the leaf ribs of a kind of palm, made to fit the bore of the gun by a wrapping of wild cotton fastened with a fibre of silk grass. Great art is required to put on the cotton properly. The arrow is about ten inches long, no thicker than a crow quill, and at one end is brought to a point as sharp as a needle by scraping it between the keen-edged saw-like teeth of the parai fish. One-half of a parai jaw is always suspended to the quiver.

The vegetable poison used for envenoming the arrows is called "curari". It is is extremely powerful and will kill a man within a few minutes when introduced into the circulation by an arrow point, though it is harmless when swallowed. It is very difficult to procure the strongest "curari" from the natives, who are most unwilling to part with it. The arrow heads are kept carefully separate from the shafts as a precaution against accidents, the savages themselves being very much afraid of the poisons which they employ. The secret of preparing the poison is handed down by the medicine men from generation to generation, and the common people are not permitted to know it.

First must be sought the curari vine, which is closely allied to the tree which furnishes strychnine, and to the upas tree, from which the Dyaks of Borneo get the poison for their arrows. When the poison maker has found the curari he looks for two bulbous plants, the stems of which yield a glutinous juice. Another vegetable ingredient is the bitter root, commonly used by these savages in poisoning water for the purpose of catching fish. To the mixture of these elements the medicine man adds two kinds of venomous ants and the poison fangs of deadly species of snakes. The whole is allowed to simmer over a fire, the snakes' fangs and ants being pounded and thrown into the pot. The boiling is continued until the poison is reduced to a thick brown syrup. Finally a few arrows are dipped experimentally in the poison, and its effect is tried upon some animal or bird. If satisfactory the poison is poured into a spherical earthenware pot, in which it is kept, carefully covered over with leaves, to exclude air and moisture.

* * *

Poisoned Arrows.

"The use of poisoned arrows is undoubtedly of very ancient origin," said Dr. W. J. Hoffman. "They are believed to have been employed in Europe in prehistoric times, and later on, according to Aristotle, Strabo, and Pliny, the Celts and Gauls envenomed their shafts with the juice of a plant of the genus hellebore. The Scythians prepared arrow poison by mixing serpent venom with the serum of putrid blood, and other instances are recorded in literature of peoples about the Black Sea in Asia Minor who practised similar arts.

"The Ainos of Japan prepare a poison for spreading upon bamboo or metal arrow points to kill game with, a small portion of flesh abont the wound being cut out before the animal is cooked and eaten. In Java, Borneo, New Guinea, and other of the East India islands the same practice obtains to a considerable extent. The poisoning of arrows prevails extensively in Africa, particularly on the west coast, in the Gaboon, among the Somali, and with the Bushmen. By the Bushmen the juice of a plant is used, mixed with the pulp of a venomous worm.

"The best known and most active of poisons is the woorara or 'urari' of So. America. It is chiefly used for the tips of darts blown from the blowgun, and the most important ingredient is the juice of the plant from which strychnine is obtained, to which is added certain other vegetable elements and serpent venom. In Central America poisons are also employed on arrows and blowgun darts. The Caribs employed similarly a poison made from the sap of a tree called the 'mancenilles.' The antidote was the application to the wound of what we know as 'arrowroot.'

"The Seris of northwestern Mexico prepared poison by putting into the ground a cow's liver, rattlesnakes, scorpions, centipedes, and other unpleasant things, and beating them with a stick, into the mixtures the arrow points were dipped. The Apaches and neighboring tribe were until recently in the habit of smearing upon their arrows a composition said to consist of decomposed deer's liver and rattlesnake venom. In some instances crushed red ants are also reported to have been used. A microscopic examination of such a coating upon arrows obtained from Apaches in 1871 showed the presence of blood and a crystalline substance that was apparently rattlesnake venom. The venom of serpents retains its poisonous properties, when dried, indefinitely. One instance of poisoning by such an arrow mentioned to me was that of a man whose wound was a mere scratch on the shoulder blade, but previous to death, which ensued, the flesh of the man's back fell off, exposing the ribs and spine in several places.

"The Shoshone and Bannock Indians state that the proper way to poison arrows, as formerly practiced by them, is to secure a deer and cause to be bitten by a rattlesnake, immediately after which the victim is killed, and the meat removed and placed in a hole in the ground. When the mass has become putrid the arrow points are dipped into it. The Clallams of Puget Sound used to make arrow points of copper, which were afterward dipped in sea water and permitted to corode. I have never met an Indian who would admit the use of poisoned arrows in warfare against man. In nearly all instances when poisons are prepared by Indians the operation is performed with more or less ceremony, chanting and incantation, for the purpose of invoking evil spirits or demons. In their belief the effects of poison are due wholly to the presence in them of malevolent spirits or demons, which enter the body of the victim and destroy life."

* * *

A few days ago Manuel Garrizo, a Mexican laborer on the Prairie Rose Ranch, near this town, found what is thought to be a relic of the Aztecs. It is the head of a man inclosed in a box of virgin silver. It was found in a mound at the foot of the Horsehead Hills, a range running north of this place. The mound, which is a small one, had always been looked upon as natural, but now it turns out to be the burial place of a vanished race. Garrizo wanted dirt to fill a low place near his door and took it from the mound. He dug several feet into the mound when he discovered a metal box, which he opened, and in it found a peculiar round object. It appeared to be a clay ball, but when he struck it he found that the clay covered a cloth, which was wrapped about a skull. It was rather a mummied head, for the skin and hair were there. Thinking he had found the evidence of some crime, he carried the whole to the priest of the neighborhood. The priest at once recognized that it was a relic of antiquity. The head is that of an elderly man of undoubted Indian origin, as shown by the high cheek bones and long black hair. One temple is crushed in, showing how he met his death, though the hair is plastered down over the break in the skull. The box is roughly made and is covered with rude hieroglyphics representing a sacrifice to the gods, thus proving its antiquity and its having been the work of Aztecs. That the head had been subjected to an embalming process is proven by the absence of the brains and its remarkable state of preservation.

A. F. B.

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The Archæologist.

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MODERN QUARRY REFUSE AND THE PALÆOLITHIC THEORY.

[BY W. H. HOLMES.]

[From Science, Vol. xx, No. 512, P. 295; Nov. 25, 1892.]

One of the most important industries engaged in by the American aborigines in pre-Columbian and largely also in post-Columbian time was the search for and acquirement of the raw material for making implements and utensils of stone. Quarrying and mining were carried on in many places upon a vast scale, and in one case at least the work has been prosecuted without interruption down to the present time. The operations were, in most cases, carried on in remote or out of the way places, so that the sites remained for a long time undiscovered, and the industry and its accompanying arts have to a great extent escaped the attention of archæologists. This work is now undergoing thorough investigation, and will henceforth take its place among the most important achievements of the native races, a work claiming precedence over nearly all others, lying as it does at the very threshold of art and constituting the foundations upon which the superstructure of human culture is built. Within the limits of the United States flint, chert, novaculite, quartz, quartzite, slate, argillite, jasper, pipestone, steatite, mica, and copper were most extensively sought.

The work in the quarries producing flakable varieties of stone was confined almost exclusively to obtaining and testing the raw material and to roughing out the tools and utensils to be made. The quarrying was accomplished mainly by the aid of stone, wood, and bone utensils, aided in some cases, perhaps, by fire. With these simple means the solid beds of rock were penetrated to depths often reaching twenty-five feet, and extensive areas were worked over, changing the appearance of valleys and remodeling hills and mountains. The extent of this work is in several cases so vast as to fill the beholder with astonishment. In one place in Arkansas it is estimated that upwards of 100,000 cubic yards of stone have been removed and worked over. The most notable features of these remarkable quarry sites are the innumerable pits and trenches and the heaps and ridges of excavated debris and refuse of manufacture surrounding them.

Many of the excavations have a new look, as if deserted but recently, whilst others are almost wholly obliterated as if by age. It is essential to observe, however, that where pits are sunk in solid rock and upon convex surfaces they fill very slowly, and that those in friable materials and upon slopes or concave surfaces fill rapidly. The oldest appearing may, therefore, be the youngest.

Several great quarries from which the flaked stone implements of the aborigines were derived have been examined. One of the most important is situated in the District of Columbia, two are in Ohio, two occur in Arkansas, one is in Pennsylvania, and another in the Indian Territory. These quarries cover areas varying from a few acres to several square miles in extent. They are pitted and trenched to various depths, and are thickly strewn with the debris of manufacture, including countless numbers of partially worked or incipient implements rejected on account of defects of texture and fracture resulting in eccentricities of shape. These rejects are extremely uniform in type in these quarries as well as elsewhere throughout the country, varying little save with variations in the nature and conditions of the raw material, the general result aimed at being always the same. It is therefore inadvisable in this brief sketch to describe the quarries separately or in great detail, as other more important matters must receive attention.

Rudely flaked stones are not confined to the great quarries: the raw material was worked wherever it was found scattered over the surface of the ground. The refuse deposits of village and lodge sites located conveniently to the stone-yielding districts also naturally contain many rejects of manufacture. Beyond these limits—the limits of the raw material—the rude specimens are rarely found. The main difference between the quarry shaping and the shaping done upon isolated shops and village and lodge sites is that upon the former, where the work was carried on extensively and consisted in securing the raw material in convenient form for transportation and trade, no specialization was undertaken, whereas upon ordinary shop and dwelling sites the full range of the roughing-out and finishing operations was sometimes conducted, the implement shaped being carried directly through from beginning to finish. In all cases the operations of shaping were, in the quarries, confined to free-hand percussion, further and more refined shaping being conducted elsewhere and employing the more delicate methods of indirect percussion and pressure.

The hammers used in breaking up the rock and in flaking are very numerous in most quarries: 500 examples, varying from 1 to 12 inches in diameter, were picked up in a few days' work in one of the great quarries of Arkansas. These hammers are generally of artificially discoid or globular forms. Such artificial forms of hammers are rare, however, in the bowlder quarries of the east, since bowlders of suitable form could be picked up on all hands and were discarded and fresh ones selected before the outline was perceptibly or seriously modified by use.

The true quarry, or more properly speaking the quarry-shop, product—that is to say, the articles made and carried away—may readily be determined in each case. This is rendered easy by the occurrence in the quarries of specimens broken at all stages of progress from the beginning to the end of the roughing-out process. The final quarry-shop form—and it must be especially noted that there was practically but one form—is naturally something beyond or higher than the most finished form found entire among the refuse. This form is necessarily, however, quite well represented by specimens broken at or near the final stages of the work. A most exhaustive examination of the great quarry sites has shown beyond the shadow of a doubt that this final form was almost exclusively a leaf-shaped blade represented on the sites most accurately by broken pieces, all the acceptable blades having been carried away. This is the blade, varying in size and outline with the nature of the material and the particular end kept in view by the workmen, so often found in caches or hoardes distributed over the country and occurring in greater or less numbers on nearly every important village site. The place of this blade in the series of progressive stages of the manufacture of flaked tools is readily ascertained by the systematic study of the subject. It is the form through which nearly every common American variety of highly-developed flaked tool must pass before its final specialization is attempted. It is the blank form ready for the finishing shops, tested in the quarry shops for quality of material and availability for further elaboration, and reduced in weight so far, and only so far, as to make transportation easy or profitable.

In most of the quarries a limited number of cores are found, from which small, generally very delicate, flakes were removed for use in the arts, and used, as a rule, apparently without much modification of shape. They were probably hafted for uses in which delicate manipulation was necessary. Their production was not an important feature of the quarry-shop work.

The question, very properly raised, as to what we really know of the nature and destination of the leading quarry-shop product, the blade or blank form, may be answered by asking another question. Let us inquire whence came the millions of flaked implements of quartz, quartzite, chert, flint, slate, argillite, jasper, and novaculite that cover the hills and valleys of America, that occur upon every fishing-ground, shell bank, refuse heap, and village site occupied by the Ameaican aborigines, historic and pre-historic? They did not grow to be picked like ripe fruit from trees, nor could they have been dug up like potatoes from the ground. Where are the quarries and the shops from which the Indian secured his enormous supplies? For every million of spear and arrow points, knives, perforators, and scrapers—and there were many millions used by him—there are somewhere in America many times as many millions of broken and malformed failures of the very kind found in our quarries and shops, and where are they now but in these quarries and shops? The conclusion is inevitable. The finished and unfinished (or rude) forms complement each other, and constitute a unit in art and in time. It was only our entire lack of knowledge of the subject that made other theories necessary or other conclusions possible.

These determinations with respect to the nature of the great body of the rudely-flaked stones of America may be expected to have some bearing upon the question of the occupation of this continent in glacial times by a people not yet advanced beyond the primal or palæolithic stage of culture, since the theory of that occupation is based upon the discovery of closely analogous objects in the gravels and elsewhere.

Before the refuse of quarrying and manufacture were studied and the true nature of the rudely-flaked forms determined, these objects had been quite extensively collected, and because of their rudeness and their supposed close resemblance to the early forms of European flaked-stone tools, had been classed as palæolithic and were so labeled in many museums, and as such found a place in the archæologic literature of both continents. It is now conceded by scientific men that this is all wrong, and that in the present state of our knowledge the separation of a single specimen from the main body of flaked stone art in America, save upon purely geologic evidence, is wholly unwarranted.

It is manifestly folly to attempt to select from the mass of these objects certain individual specimens to be arbitrarily called palæolithic. The selections made are quite as likely to be the youngest as the oldest. It is a well-established fact that many of the rudest flaked forms known, the simplest possible art shapes, are obtained from the shell-deposits and from the soapstone quarries of the eastern United States, and thus represent the most modern phases of neolithic Indian work in stone. Even if it be conceded for the sake of argument that there are multitudes of true palæolithic objects and implements scattered over the country, it is certain that up to the present date we have established no standards of form-comparison by means of which they can be detected.

Until geologic formations, glacial or otherwise, have furnished demonstrably palæolithic forms in sufficient numbers to warrant the establishment of types of implements peculiar to these formations, surface finds can be of no service whatever to advocates of the palæolithic idea.

The reported discovery of rude forms of implements in the gravels at Trenton, N. J., and subsequently at several points in the Mississippi Valley, led to the conclusion that palæolithic man dwelt here in gravel-forming time, and the theory that a well-differentiated period of rude flaked stone art precedes, in the normal order of development, a pecked and polished stone period, found a foothold in this country. Observations have multiplied, and the occurrence of flaked stones in the gravels is now supported by a large body of evidence. If even a small percentage of these observations are authentic, the evidence ought to be considered sufficient to settle one of the questions at issue, that of the age of occupation: for the finding of a very small number of works of art, either implements, shop rejects, or flakes—in fact, anything artificial—in the gravels by competent and reputable observers of geologic phenomena is all that is required to satisfy the scientific world of the presence of man of some grade of culture, primitive or otherwise, in gravel forming times. To this conclusion there can be no serious objection. So far as I know, the possibility that there were glacial men, inter-glacial, and post-glacial men somewhere upon the continent is not seriously questioned by any one. The infancy of the race may have been passed upon the eastern continent, but there is no sufficient reason why America may not have had a share in the nursing.

As I am not prepared to challenge the testimony brought forward by various collectors tending to establish the glacial age of human occupation, defective as much of that testimony seems to be, I will not raise the question of age, but proceed to consider the bearing of the evidence furnished by the quarry shops upon the question of the grade of culture indicated by the so-called gravel finds: the age, or period, of the occupation and the grade of culture attained being two very distinct things. Admitting for present convenience, then, that men dwelt in America in glacial times, I take up the questions as to whether the culture of the hypothetic people, as indicated by the evidence furnished, is surely palæolithic. It has been repeatedly stated, and is still believed by many, that the gravel finds of the eastern United States closely resemble well-established European types of palæolithic implements. The critical observer will find, however, that this resemblance is superficial, and that they have a very much closer analogy with the rude quarry-shop rejects of America; and the latter are not really implements, and should not be called such any more than the faulty blocks of marble left in and about the quarries at Carrara should be classed as statuary. The distinctive feature of European palæolithic implements is, or ought to be, their evidence of specialization of form, their adaption to definite use, indicated by what is known as secondary flaking; whereas the objects from the American gravels, with rare exceptions indeed, exhibit a total lack of this character. The semblance of specialization in thousands of the rude quarry rejects which have been worked hardly more than to test the flakability of the stone, not having begun to assume the contour and appearance of the implement contemplated by the workman, is more pronounced than in any of thse gravel specimens. Appearance of specialization of form, may, therefore, signify nothing, and, if found must not be taken alone as sufficient evidence that the object having it is a bona fide implement.

It should be further noted that not only are the gravel finds identical in form and material with the ordinary failures of the modern aborigines, but that they display the same mastery of shaping operations, beginning in the same way, progressing along the same lines, and ending at the same points, exhibiting no evidence of special adaption to use in cutting, digging, picking, striking, or any other primitive manipulated act. It is also observed that none of these articles exhibit well-defined evidences of having been used, although it must be conceded that the rudest peoples made their tools for use; and it would appear that, as a rule, if they had been used they would bear very decided indications of that use. Considering all of these points, I call attention to the extreme probability that these reputed gravel objects are not implements at all, but ordinary failures resulting from the manufacture of more highly specialized forms.

Again, it will be remembered that the gravel finds of the Pacific coast and some of those east of the mountains are neolithic, the forms being of a high grade technically and functionally, so that neolithic man is shown to have probably existed upon the continent whilst the eastern gravels were forming, and the condition of the art phenomena imply that he had dwelt here or somewhere east, west, north, or south, for a very long time, for thousands of years, if not for tens of thousands, and that, too, since he had passed the primal stages of art designated palæolithic.

How then is it to be proved that these particular rude forms, found so sparingly scattered through the gravels at Trenton and elsewhere, really represent and prove a palæolithic age, since they may simply be the rejects of manufacture left upon the banks of the glacial rivers by advanced neolithic men, who dwelt as intelligent men would upon the upper terraces out of reach of the icy floods? The argument that in these gravels rude forms only are found has no value whatsoever, since, as I have shown, it is the rule that where the raw material was sought beyond habitable sites no work save the roughing-out was undertaken, and no flaked forms save rude ones were left upon the ground. Because a few dozen specimens of rudely-flaked stones are found in the gravels, and no highly specialized forms or other works of art are found with them, the conclusion is reached that they are palæolithic implements and that the art of the gravel-forming time was exclusively rude or palæolithic. Yet we may go down to the Potomac in the District of Columbia, or to the Washita in Arkansas, or to the Neosho in Indian Territory, and gather tons of similar rude forms made by our modern neolithic tribes, without finding a single specialized form or a single object of art aside from these rude forms. It is not my intention, however, to try to reconstruct the culture of that time, as I am not sure that there was any culture, but to point out the total inadequacy of the evidence upon which the theories of a particular culture are based.

The torrent-swept flood-plains of glacial times were hardly habitable places, and we do not know that there was game or fish to be sought there: but the great beds of bowlders then and there accumulating furnished more or less raw material suitable for flaking, and if men, supposing they existed, coming down to the banks of the streams during periods of low water, essayed to rough-out their spear-points and knives in the usual fashion, the ever-recurring torrents would scatter the refuse about, leaving the coarse pieces in one eddy and whirling the lighter ones to other eddies below.

From this and from what has gone before it is clearly seen that these reputed gravel objects are probably not implements at all, and, whether they are or not, that they are as likely to have been left by neolithic as by palæolithic men.

So far have the advocates of a European classification for American phenomena gone beyond the limits of prudence in the treatment of these so-called palæolithic stones, that a radical change is demanded in the methods of classifying and labeling these objects in many of our museums: and it is to be lamented that a revision of all literature relating to the subject cannot be made in order to prevent the further spread of errors already too deeply rooted in the minds of the people, without offensive criticism of the work of living students.

This point may be illustrated by one example of the many that could be cited. The quartz objects from Minnesota, usually known as the Babbitt finds, of which so much has beem said and written, prove on careful examination to be modern work-shop refuse settled into the talus of the glacial terrace. The slightly worked pieces heretofore collected and published as palæolithic implements almost without question on the part of archæologists as to their origin or manner of occurrence, have no more intimate relation to the history of the glacial terraces than have the trees that grow upon their surface or the rodents that burrow in their sandy soil.

No rude flaked stone should be classified or labelled as an implement until it is proved to be an implement, and no specimen should be called palæolithic simply because it is rude or because it is found in the gravels, howsoever old. The attempt to classify these rude stones and to arrange them under types after the manner of European implements is sufficiently characterized, when it is stated that there is not in the museums of Europe or America a single piece of flaked stone found in place in the gravels of America and satisfactorily verified that can with absolute safety be classified as an implement for all.

If I should find a rude stone in place in the gravels—I have tried long in vain—I should permit myself to say only this, "Here is a work of art dating back to glacial times, I cannot tell whether it is a finished implement or not, as there are but slight signs of specialization and no indications of use, and I cannot tell whether it was made and left by a palæolithic or by a neolithic people, because neither of these peoples had a patent upon rude forms." Even if rude flaked stones are found in gravels ten times as old as the Trenton gravels, it must still be shown that they are not neolithic before it can be safely asserted that they are palæolithic, for the exclusively rude period of flaked art observed in Europe is so extraordinary that its repetition in other countries would approach the marvelous.

Little by little the advocates of a period of palæolithic culture in America have been forced to give up the idea that there is any other reliable test of the age of a culture than that furnished by geology; yet they are still going on utterly failing to recognize the equally important fact that geologic phenomena cannot be safely observed save by geologists, and I may add with respect to gravel phenomena that the observations of geologists who have not especially studied gravels being of little greater weight than those of laymen. They must further concede that the finding of rude implements in the gravels or other ancient formations is not proof of a palæolithic age until it is sufficiently proved that the culture represented is exclusively rude culture, a point not attained, and I fear well nigh unattainable.

It follows from the above considerations that all speculations upon the culture status, ethnic relationships and geographic distribution of gravel-man in America based upon the discovery of rude forms of art are premature and misleading, and that, instead of being on firm ground and well advanced in respect to the antiquity and history of early man in America, we are not yet safely on the threshold of the study; and it is patent that until geologists take hold of the problem and prosecute the work, not as a side issue but as a great and leading question germane to the field of geologic research little true progress will be made.

My explorations have been made with the greatest care and rarely without the aid and advice of some of the foremost geologists and anthropologists of the country. The conclusions reached have been freely discussed, and are generally approved by those familiar with the facts. These conclusions are subject to modification through the acquisition of new evidence derived from actual research in the field and in no other way.

In closing I would add that conservative students of American archæology will find it wise to consider well the following points relating to early man in America. 1. Is there a sufficiently full and sound body of evidence to demonstrate the presence of glacial man in America? 2. Is there satisfactory evidence that glacial man, if his existence be admitted upon the evidence available, was in any particular region in the palæolithic stage of culture? 3. Is there satisfactory evidence that the rude glacial finds in any case are implements at all? 4. Are deductions as to the habits, customs, arts, industries, institutions, and racial affinities of a people called for until at least one implement left by them is discovered, verified, and found to bear indisputable evidence of adaptation to or employment in some kind of use?

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PEBBLES CHIPPED BY MODERN INDIANS AS AN AID TO THE STUDY OF THE TRENTON GRAVEL IMPLEMENTS.

[BY H. C. MERCER, DOYLESTOWN, PA.]

[Read before "The American Association for the Advancement of Science." Printed in this journal by kind permission of Mr. Mercer.]

I wish to call the attention of the Section to these sandstone flakes with a pebble surface, and these chipped river pebbles the smaller of which belong to the type generally referred to as "palæolithic" in the United States.

With one exception (the large one from Frys Run on the Delaware,) they represent that region of the Upper Susquehanna lying between the glacial morain at Beach Haven on the eastern branch and the mouth of the Juniata, the gravel beaches and hard clay banks with relic bearing strata on shore and island, at Saw-mill creek, Mahoning, Pulaski, Johnsons' creek and Hall's island.

When we find these conditions repeated six times at the places I have named, there is no guesswork in the inference that the chipped pebbles were the work of men, who, knowing the use of wild hemp and rope-spinning, caught fish in nets; who had quarried jasper in situ, for it is hardly possible that all the black arrow heads and chips on the beaches came from river pebbles of that material; who understood the potters' art and who made polished celts, spearheads of finished workmanship, and banner stones.

Let us look at the specimens and let us class with them this pebble from which we believe a "Tesh-o-a" has been skillfully chipped, found lying amongst them. And here is the "Tesh-o-a" itself. We know that it is a knife, for the Shoshonees have told us so—a cutting implement with a fine sharp edge all around it, knocked at one blow from a pebble. So useful, so easily made, so ready to hand wherever pebbles lie together on the earth, that the modern Indians, equipped with gun, iron knife and government blanket still uses it, as he would use the fire drill at a pinch, as a thing elemental, common to the life in nature, as one of those ancient secrets not to be forgotten save by the artificializing of all the conditions of his life.

But it is of these other flake knives that I wish particularly to speak, because though made like the teshoa, at a single blow, they are obviously simpler, because having been knocked from the edge rather than the middle of a pebble, they have required less skill and force in the concussion that produced them.

Scattered about among the "teshoas" and stone hammers, with their cutting edges similar dulled by well weathered marks of usage, is it easy to help believing that they were made for the same purpose? And that these large chipped masses, lying with hammerstones hard by, sometimes showing no signs of use on their cutting edge and often weighing 15 to 20 pounds, were anything but the nuclei from which these knives were flaked? Yet, while, allowing this, that the chips and not the nuclei, were in some cases the real implements sought after, we realize at the same time that the first few blows of stone upon stone, pebble upon pebble, whatever the end aimed at, must have produced strikingly similar results, that many of the chips were not knives, and many of the nuclei were not knife-material.

Argillite and sandstone blades were made on the Delaware and Susquehanna from river pebbles at work sites as at Point Pleasant for instance, where the flakes and cores though resembling these had a different meaning. There were jasper quarries at Durham and Saucon creek where the chief story of the refuse may be that of blade making. Indeed the savage probably chipped stones for many purposes as yet undreamed of.

Let us only insist that here were six cases where the stone chippers' object was to make flake-knives, and that at these sites one distinct process has been added to those already studied and classified as illustrative of prehistoric life in America, a process, which like the art of making "teshoas", that seems but a refinement of it, may well have been too useful, too handy, too adequate to

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DISTRIBUTION OF STONE IMPLEMENTS IN THE TIDE-WATER COUNTRY.

[BY W. H. HOLMES.]

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The tide-water portions of Maryland and Virginia have an area nearly equal to that of the State of Maryland. About one-fourth of the area is occupied by broad arms of the sea, chiefly Chesapeake bay and its tributaries. and the land is a low but handsome plain broken by erosion into hills. valleys. and terraces. It extends inland from the Atlantic seaboard to the base of the highland or Piedmont plateau, which rises on the west to the Allegheny mountains. The curved line separating the two topographic divisions—the lowland and highland—is marked by falls in all the rivers and by the location of towns and cities through which pass the great highways of travel connecting the north with the south. Upon this line are located Philadelphia, Havre de Grace, Baltimore, Laurel, Washington, Fredericksburg, Richmond, and Petersburg. This was the shore-line of the Atlantic when the formations constituting the lowlands were laid down.

The separation of the lowland from the highland is not a topographic separation only, there are pronounced biologic and geologic distinctions, and these combined in archaic times to produce marked anthropologic distinctions. The tide-water region furnished a plentiful supply of game and fish, and in the brackish and salt water areas an abundance of oysters. The natives lived much upon the water and were perhaps more nearly a maritime people than any other group of tribes in the east. Their peculiar biologic environment had a marked influence upon their art, giving it unique forms and exceptional distribution, but their unusual geologic surroundings had a still more pronounced effect upon their implements, utensils, and weapons, limiting the forms and sizes and determining to a considerable extent the kinds employed in the various districts independently of biologic and other conditions.

In early historic times the tide-water country was inhabited by numerous tribes of Indians, mainly of Algonquian stock, subject to the renowned Powhatan. A few other nations were located about the headwaters of Chesapeake bay, and others appeared at times along the western and southern borders. The period covered by this occupation practically closed before the middle of the last century. Its beginning is not determined, but cannot extend very many centuries back into the past. Of antecedent or prehistoric peoples, if such there were, we have no information, for the art remains are simple and homogeneous, giving no hint of the occupation of this region by other than the historic tribes. The region is nearly identical with that explored by that intrepid and illustrious adventurer and colonist, John Smith, whose accounts of the natives are among our most valuable contributions to the aboriginal history of the Atlantic States.

The geology of the tide-water country is wholly unlike that of the highland, and the rocks available to the aborigines in the two regions were not only different in distribution but peculiar in the shapes they took and in other features that affect the character of the utensils made and employed. In the highland, west of the dotted line on the map, the varieties of rock occur in massive forms and with indefinite independent distribution. The workable varieties, such as quartz, quartzite, rhyolite, jasper, and flint, were much sought by the aborigines of the lowland. Fragmental material was to be obtained almost everywhere upon the surface, but choice varieties were confined to limited areas and often to distant regions, and where the surface exposures were not sufficient to supply the demand, quarrying was resorted to and the work of securing, transporting, and trading or exchanging the stone must have become an important factor in the lives of the people. The masses of rock were uncovered, broken up, and tested, the choice pieces were selected and reduced to forms approximating the implements to be made, and in this shape were carried to the lowland.

In the lowland all varieties of hard stones are fragmental and the species are intermingled in varied ways. These fragments of rock are not merely broken angular pieces, such as characterize the surface of the highland, but are rounded masses and bits, known as bowlders, cobbles, and pebbles, and comprise chiefly such tough, flinty, homogeneous stones as are available in the arts of primitive men. Nature, in her own way, selected from the highland along the stream courses the very choicest bits of the crumbled rocks, reduced them in hundreds of cataract mills and in the breakers of the sea shore to rounded forms, and deposited them here in the lowlands in great heaps and beds ready to the hand of primitive man.

At first it would seem, to even the keenest observer, that a cobble-stone or ovoid bowlder or pebble would be a difficult form of stone to utilize in making knives, spear-points, arrow-points, drills, and scrapers. The smooth rounded mass had to be transformed into a thin blade, every contour of which is incisive or angular. So far apart are the two classes of forms that few people have thought of the bowlder as a prominent source of these objects, but when we look into the matter more carefully we find that nature has not provided any other form or conformation of the several tough varieties of stone so perfectly suited to the purposes of the stone-implement flaker as the bowlder or pebble.

Each river brought down from the highland only such varieties of stone as belonged to the drainage of that river, so that in one valley one set of materials prevails and in another a different set of materials appears, varying with the geologic formations of the region drained. Rivers having identical formations will have nearly identical bowlders. Long rivers crossing numerous formations will have many varieties, short rivers crossing but few will have but a limited number.

There is also a selection as to size by each drainage way. Near the base of the highland, where the force of the current is reduced by meeting tide-water, the larger bowlders are dropped, the smaller ones are deposited farther down, and the pebbles and sand are carried far seaward. Small and weak streams transport fewer pieces and drop them sooner. This selection does not hold good with ice transportation, which agency has carried irregular masses of stone to many widely distributed points. Notwithstanding the fact that all water-transported stones are more or less rounded, there is a selection with respect to degree of roundness. If dropped early in the progress of transportation the bowlder is imperfectly rounded: if carried far, it is fully rounded. Near the margin of the highland, therefore, there is a large percentage of irregular forms. These conditions are probably considerably modified by the action of the waves along the ancient sea-shore which skirted the base of the highland. Such fragments as were subjected to wave action became fully rounded and were deposited in beds along the ancient beach lines. It is not easy to distinguish the beach-rolled material from that rounded by the flow of streams, both agencies having, no doubt, frequently acted in turn upon the same material.

Again we observe that on river banks near the base of the highland many varieties of rock are present, but with each mile as we descend the number is diminished, the softer species are reduced to sand as they move toward the sea and one after another disappears. Quartz, being the hardest, is last to yield to the erosive agents, and at various points along the ocean beach well-polished quarts pebbles are found.

A comparison of the Potomac and Patuxent rivers, with respect to these points, is instructive. In ancient times both streams as they descended from the mountains gathered fragments of rock and carried them downward until the soft and friable ones were reduced to sand and the tough, flinty varieties became bowlders and pebbles. The latter consisted chiefly of quartz and quartzite. The Potomac was a long stream, heading far to the west and cutting through many ranges of mountains and hills. It crossed heavy beds of quartzite in the regions of Harper's Ferry. This rock is tough and massive and breaks up into rather large fragments; thus it is we have many large quartzite bowlders deposited in the valley about Washington and below, the sizes diminishing toward the sea. Between Harper's Ferry and Washington the river crosses a belt of gneissic rocks intersected by many veins of quartz. This latter rock is hard and brittle and breaks up into small fragments, which, when rounded, are usually of the size denominated pebbles. These were taken up by the waters in countless numbers and distributed with the quartzite bowlders from Washington to the sea: but the quartz is harder than the quarzite and resisted the erosive agents more successfully, so that after the quartzite disappears there are still quartz pebbles in plenty.

The other stream, the Patuxent, has a limited drainage and does not cross the quartzite belt, but drains the quartz-bearing belt. Below the point of its entrance into the tide-water country at Laurel we find of the flakable stones chiefly quartz in small fragments: lower down all are well rounded, forming pebbly gravels.

It is thus seen that nature has selected the rocks used by the tide-water peoples and has distributed them in groups varying with original location, with hardness, with toughness, with shape, and with size.

The effect of the conditions of distribution upon the stone art of the various districts was necessarily very pronounced. One community located conveniently to deposits of large bowlders used large stones, and the tools shaped from them average large. Another community located in a pebble-bearing district utilized pebbles, so far as they were capable of utilization, and this people had few large tools and many small ones, the average size being very small. Dwellers in quartzite-bearing districts had quartzite tools; those having quartz deposits had quartz tools, and those residing near the base of the highland had many varieties of stone, and hence used a much greater diversity of stone tools, since the working qualities or capacities of each stone varies from the rest.

As a result of these conditions the tide-water Potomac is rich in chipped tools both of quartzite and quartz of home production. The Patuxent yields a large percentage of quartz tools, most of which are native. The Potomac yields to the collector a large percentange of large tools: the Patuxent a large percentage of small ones. These remarks relate to the native varieties of material and implements made from them. Exotic materials had their own peculiar distribution, which will be examined farther on.

Nearly all rude, bulky implements of chipped stone and all failures or rejects of manufacture are, as a matter of course, found upon or near the sites from which the raw materials were derived. Rejects are large and clumsy on the upper tide-water Potomac, because of the large size of the bowlders available. They are small on the Patuxent because the pebbles utilized were small.

Again, the percentage of the failures--the turtle backs and other refuse of manufacture—decreases rapidly with the distance from the source of supply of the raw material, extending little beyond it. On the source of supply of the raw material failures and finished implements or rejects would exceed finished implements in numbers, but beyond this the latter are almost wholly prevalent. So-called paleolithic forms—the rejects of manufacture—are thus confined to limited areas, the areas producing the raw material: and it is easy to see how in various sections of the country before the true nature of these forms was known certain localities were thought to have been especially favored by paleolithic man.

It would thus appear from what has been said that the artificial distribution of materials is limited by—is a modification of—the natural distribution, and that each class of artificial object is scattered in a way peculiar to itself: but the human agent is an important factor. Other things being equal, human distribution of small things is far, of large objects near; implements of war and the chase travel far, domestic utensils remain near; improvised articles or devices are near, highly elaborated and valuable objects go far: with thoroughfares distribution is far, across thoroughfares it is near. Much-occupied sites are richly stocked with utensils, and slightly occupied spots have but few; sites near the source or sources of supply have a wealth of art, very distant ones have almost nothing: sites convenient to a plentiful supply of one material have many tools of that material, sites remote from any of the sources have a limited supply from many sources. A sedentary people will not distribute widely: wandering or semi-sedentary tribes will transport their possessions to many distant places, and sites occupied by numerous tribes in turn will have diversified art remains. It may be further noted that on sites devoted to single or simple industries the range of tools will be small and on sites where occupations were varied the range will be large, and that where peoples were varied, occupations varied, materials varied, and time long we will have the widest range.

The tide-water peoples were by no means content with the materials supplied by the province in which they lived, although these naturally received first attention. Not being favored by nature in the quality and range of their materials, they seem to have searched far and near for those finer-grained homogeneous varieties so much used in other regions. They sought flint in the mountains of Virginia fully a hundred miles beyond the tide-water limit; they discovered a slaty-appearing volcanic porphyry, called rhyolite, in South mountain, 75 miles northwest of Washington, and jasper and argillite were obtained from eastern and northeastern Pennsylvania. It is probable that in some cases the tide-water peoples made long journeys in search of these rocks and spent short seasons quarrying and roughing out the blank forms and selecting choice bits to be carried home. On the other hand, much of the material from these distant places may have reached the lowland by exchange or trade, and a certain amount, not ascertainable, of the supply of implements of exotic materials is no doubt due to visits and incursions by peoples occupying the regions of source of supply: for example, jasper may have been brought by the Susquehannocks of the north, and flint by the Monacans of the west. It may be that in time, by careful comparison of the forms of implements characterizing the various exotic materials, something may be suggested of the presence of neighboring peoples in or at least of their influence upon the art of the tide-water region. Distribution is very general, implements made of all of the varieties of stone mentioned being scattered more or less fully over the Chesapeake-Potomac country as far south as James river.

Jasper, the quarries of which have recently been located by Mr. H. C. Mercer, of Philadelphia, is more plentiful in the upper Chesapeake and Susquehanna regions. Argillite, which was obtained in the Delaware valley, did not find its way to any great extent into Maryland and Virginia, although several caches of blades have been discovered in the middle Chesapeake region, and implements are occasionally found. Rhyolite implements are most plentiful in the Patuxent and Potomac valleys, and especially in those portions of them adjoining South mountain. The quarries of this stone are in Pennsylvania, near the head of the Monocacy, and the implements are very numerous on that stream, and fragments of considerable size have been carried far down the Potomac. Transportation was no doubt mainly by water. Probably one-fourth of the spear and arrow points of the Potomac region are made of this rock. Flint of a dark or blackish hue was used in making smaller projectile points, as were also quartz and jasper. These materials, breaking naturally into small pieces, were not well fitted for the making of large implements.

It should be noted that of these exotic materials we have in the tide-water country very few large or rude implements, and, as a matter of course, failures of manufacture are rare, save those that result from breakage during such specializing and finishing operations as were conducted subsequently to transportation from the quarry. Of quartz and quartzite, the native flakable stones, there are countless rejects of manufacture of all grades, as previously described.

It may be said of quartzite and quartz that a portion of these materials—perhaps a large portion., especially of the latter—were secured from the highland beyond the tide-water limit, and no one can say from the examination of ordinary finished implements of these materials whether or not they were made from a native bowlder or from a foreign mass or flake: but the presence of countless numbers of the rejects of manufacture from quartz and quartzite bowlders and pebbles within the tide-water area, and the rarity, so far as I have been able to discover, of refuse of manufacture in the highland, seem to make the true conditions clear.

Cut, pecked, ground, and polished implements of usual types are common in this region. Soapstone, used in making pots, pipes, sinkers, and ornaments, was quarried in hundreds of places along the eastern border of the highland. The unfinished objects are found on the quarry sites and upon dwelling sites near by. The finished utensils and implements are scattered far and wide, but grow less plentiful as we approach the Atlantic coast. The picks and chisels used in working the soapstone are confined to the quarries and their vicinity.

Axes, celts, and the like were made for the most part of tough bowlders of volcanic and granite rocks, obtained from the stream-beds or from the highland. Failures resulting from the manufacture of these implements are frequently found upon village sites along the banks of the larger streams. Rejection or failure was not uncommon even after the pecking operations began, and breakage under the pecking hammer was not rare. It is important to observe that in many cases these implements were reduced to approximate shape by flaking, and this has given rise to several classes of flaked rejects, peculiar in shape and exceptional in material. These objects are of very rude forms that they are sometimes mistaken for very primitive implements, thus providing another trap for the unwary paleolith hunter.

The liability of the various stone implements of the tide-water region to transportation is approximately expressed in the following partial list. Beginning with those least subject to transportation and ending with those most subject to it, we have the following tentative order:

Mortars, generally improvised from bowlders having at least one concave surface which was gradually deepened by use. They were probably rarely far removed from the site of their first utilization. Many improvised tools and utensils, mullers, pestles, hammer-stones, etc., were equally home-stayers, as they were merely natural shapes picked up and adapted to the needs of an occasion.

Sharpened bowlders, improvised chopping or bone-breaking tools, occur on all river sites where bowlders were at hand. The edge or point was made by removing one or more flakes. They were not transported far beyond the limits of the bowlder-producing area.

Notched and sharpened bowlders, improvised axes, picks, or hoes, closely related to the preceding, but intended to be hafted. Their transportation was but slight, as they are rarely found beyond the range of deposits of heavy bowlders. Half a dozen blows with a hammer-stone were sufficient to fashion one of these objects.

Picks and chisels for working soapstone traveled but little beyond the quarries and the neighboring villages where the finishing was done. These consist of rude, sharp stones, of axes and celts worked over or "upset" to secure good points, and of thick leaf-shaped chisels reduced to approximate shape by flaking and then ground to an edge at one or both ends.

Net-sinkers are not common and are usually rude. They were probably carried back and forth to some extent along the streams.

Pestles, cylindrical stones symmetrically shaped and well finished by pecking, were apparently carried from place to place and perhaps for long distances.

Hammer-stones: Many of these objects were improvised from bowlders and were quickly cast aside, as already indicated, but others were carried far out into the non-bowlder-bearing region, where they acquired by use or were given purely artificial contours.

SOAPSTONE VESSELS are widely distributed, reaching in rather rare cases points 100 miles or more from the highland in which the material was quarried.

GROOVED AXES, CELTS, SCRAPERS, DRILLS, KNIVES, SPEAR-POINTS, ARROW-POINTS, as well as PIPES and ORNAMENTS, were freely transported, covering the full range of the peoples employing them, and not infrequently, no doubt, passing from district to district through other hands.

Rejects resulting from failures in specialization of transported forms and from attempts at remodelling of worn or broken tools are to be found everywhere, but rejects of the roughing-out processes are not seriously affected by the transporting agencies, remaining mainly upon the shop sites.

Some of the eccentricities of distribution may be illustrated by examples, sites having varying relations to the deposits of raw material being chosen for the purpose, as follows:

1. On a site of quarrying and manufacture where dwelling was inconvenient, as on the bluffs of Rock creek, the work was confined mainly to roughing out leaf-shaped blades, and the series of art forms comprise a limited range, including turtle-backs and other kinds of rejects and refuse. Nothing exotic, nothing finished, nothing that might not readily be classed as "paleolithic" by our American advocates of the idea of a rude stone age, was found in three month's work upon the shop sites of Rock creek.

2. On a site of quarrying and manufacture where dwelling was practicable and where lodges were actually pitched to a limited extent, we find intermingled with the rude forms some specialized ones and a few tools of exotic origin, such as projectile points of rhyolite and axes and celts, as at Riggs' mill, eight miles northeast of Washington.

3. On a site of manufacture and at the same time of extensive dwelling, as at Anacostia, D. C., where much raw material was at hand, all varieties of refuse and of rude forms are found: likewise well-shaped and wholly-finished specimens of flaked tools of local origin prevail. There are also all the cut, pecked, and polished tools and ornaments common to village sites. Besides these, many exotic materials in varied forms are found.

4. On a village site where no raw material, save small quartz pebbles, is found there will be a full range of small quartz rejects and of small quartz implements, with a liberal supply of finished implements of exotic materials averaging small.

5. On a site remote from all sources of raw material, as on the eastern shore, the objects average small and are much varied in material and style, having come far, through numerous peoples and from many sources.

Typical illustrations of the two last mentioned varieties of sites are difficult to find, for the reason that in all sections, even far out toward the present ocean beach, there are occasional ice-borne bowlders and fragments of considerable size, and these were collected by the natives and used for mortars, mullers, and for various flaked and pecked implements, and such objects destroy the entire simplicity of conditions conceived for the sites described.

A synoptical statement is made in the accompanying plate, which exhibits many of the most striking features of the flaked-stone archæology of this province, and indicates clearly the points most requiring attention in other regions. The stories of the origin and form of the materials, of manufacture, rejection, elaboration, transportation, storage, specialization, and use are all expressed or suggested. Four materials are represented, two native, in the form of bowlders, and two exclusively exotic and derived from mass deposits. Each series indicates the course of development through which most of the finished forms passed between the first stroke given to the shapeless stone and the finished work of art.

In the first and second series all the forms, from the bowlder to the most minute art shapes, are represented in solid lines, being exclusively tide-water art. Nos. 1, 2, 3, 4, 5, and 6 are shop rejects, turtle-backs, etc., and are not implements. Nos. 7, 8, and 9 are roughed-out forms, blanks, blades ready for further specialization, and are not necessarily implements, although they were available as knives and scrapers. The numbers from 10 to 18 are specialized forms derived mainly, no doubt, from bowlders, and include knives, spear-points, arrow-points, and perforators or drills.

The second series comprises forms derived mainly from quarts pebbles, and which are naturally smaller than the quartzite forms. They are drawn in solid lines, being of native derivation. Nos. 1, 2, 3, 4, 5, 6, and 7 are shop rejects, turtle-backs, and are not implements. No. 8 is a profile, showing the ordinary "peak" or hump of the reject. Nos. 9, 10 and 11 are successful blades, which may have been employed as knives or scrapers, but were usually intended for specialization into arrow-points, spear-points, perforators, etc., as indicated in Nos. 12 to 20.

The third series, consisting of objects of rhyolite, is drawn partly in solid lines and partly in dotted outlines. Those in solid lines comprise transported and specialized objects and were collected in the tide-water country. Those in dotted lines a, b, c, d, e, and f are the rejects of manufacture and are not found in the tide-water country, being obtained only on the quarry-shop sites in Adams Co., Pa. The successful blades, illustrated in g, h, and i, were carried away from the quarry to be used as they are or for specialization when the succeeding forms, j to q, were needed. The whole tide-water province is abundantly supplied with all the forms from g to q.

The fourth series, composed of articles of jasper, repeats very closely the conditions of the third or rhyolite series. The sizes average smaller on account of the minuter cleavage and inferior massiveness of the rock. The rejects of manufacture, indicated in dotted lines, are obtained mainly from the recently discovered quarries in eastern Pennsylvania. Other quarries may yet be found, and some of our rivers furnish occasional bits and pebbles of this material. The cache and finished objects, g to q, are widely scattered over the tide-water region.

Stone implements have been studied as to form, material and use, but there has been no systematic study of manufacture, and origin and distribution have been greatly overlooked. It is of the utmost importance that in taking up the stone implements of a region each leading material be traced back to its source, so that from this point of view a study can be made of the work of quarrying, shaping, transporting, and finishing. Each form or class of implement will thus be found to have left in its wake a trail of "wasters" or rejects peculiar to itself. Until these are understood, selected, and set apart there is necessarily much confusion.

It is seen by a study of the accompanying plate that a half or more of the native flaken forms of this region are actually not implements. The separation is approximately indicated by the upper braces marked "not implements" and "implements." It will be observed that this division separates the cache forms or blanks of the middle column into two parts. Portions of this class of objects were mere quarry shapes distributed to be elaborated when needed, but some of them were probably utillized in their blank shape as knives, etc., and some show a slight degree of specialization, as in No. 9 of the first series, and thus properly take their place with implements. Nearly all of the specimens shown in this vertical column are actual cache finds.

This study brings out other features of flaked-stone art which have not been understood and have thus given rise to much embarrassment and to much useless discussion on the part of those who have been talking of rejects as implements. Each material gives different forms of rejects. Each form of material gives its own styles of rejects. Each implement leaves its own peculiar rejects. If in the tide-water country six varieties of stone were used in the manufacture of flaked implements, if two of these materials occur in distinct forms and if one of them was employed in making two distinct types of implements, then there would be found here ten lines of refuse or "wasters," each furnishing its own peculiar types of rude forms. Several of these genetic lines have already been, as illustrated in accompanying plate, more or less fully traced and the rejects separated from the implements. In other sections of America and in certain provinces of Europe there may be many more than ten distinct evolutionary series, and in Europe so many centuries and successive culture periods have passed and so much has been obliterated by thousands of years of metal-age occupation that the phenomena there must be both complex and obscure. It is plain, therefore, that if the European students of rude flaked stones have not been more discriminating than most of their pupils in this country, there is still work to be done there.

The distribution of cut, pecked, ground, and polished stone implements, and the refuse of their manufacture, is governed by laws similar to those governing the distribution of flaked stone.

Each province, district, and site, here and elsewhere, is supplied with art remains brought together by the various agencies of environment—typographic, geologic, biologic, and ethnic—and the action of these agencies is to a large extent susceptible of analysis, and this analysis, properly conducted, constitutes a very large part of the science of prehistoric archæology.

It would be instructive to examine in this place, so far as is possible, the effect of the distribution of the various kinds and forms of stone upon the habits, customs, arts, industries, etc., of the inhabitants of the region, for it is plain that so important an element of environment must have a most decided influence upon all departments of culture, but such a study would carry me far beyond the limits set for this sketch; besides, such a work can be conducted to better advantage where all the phenomena of human existence are observable as with living tribes, and the laws of culture evolution thus derived are applicable to all cases and fully answer the needs of anthropology.

[Plate and Explanation on next page.]

Explanation of Plate.

This synoptical grouping of the ordinary varieties of flaked stones found in the tide-water country will, in a great measure, serve as a key to the whole subject of flaked stone art in eastern North America. and will suggest a practical method of treatment for all sections. Varieties of flaked implements not included in this series are of rare or exceptional occurrence in the tide-water country or belong to what I have designated extemporized tools.

Specimens drawn in solid lines are obtained from the tide-water region. Those in dotted lines are not found, save in rare cases, within that region, having been left as refuse in the quarries in Pennsylvania from fifty to two hundred and fifty miles away.

The two upper lines have their genesis mainly in bowlders and pebbles: the lower lines are derived from materials quarried from the mass. The left-hand vertical column contains usual forms of failures, rejected in most cases on account of defective fracture which resulted in too great thickness, thinness being essential. Our so-called "paleolithic implements" belong in this column.

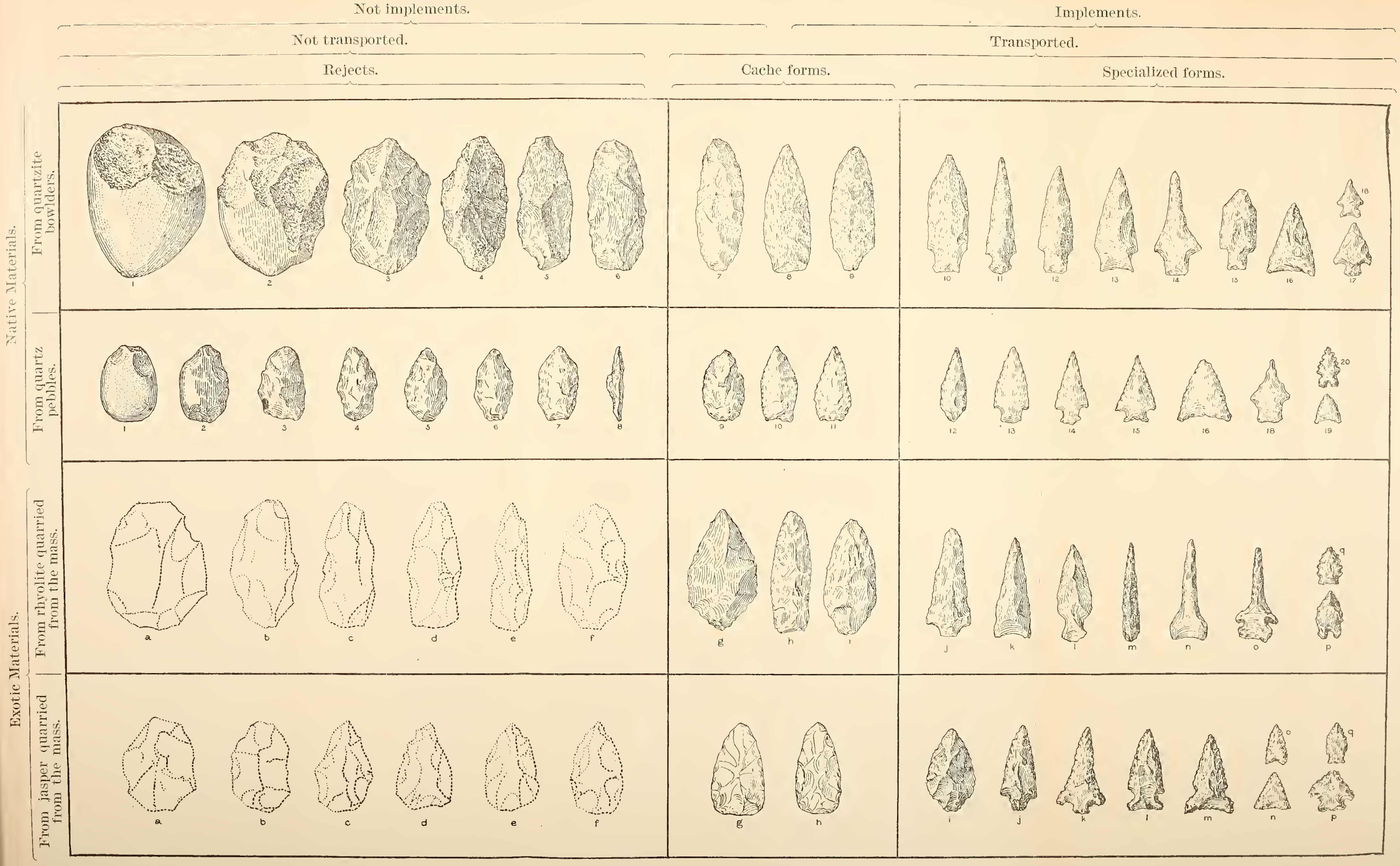
The middle column contains blades derived as indicated in the left-hand column. They were carried away from the quarries and shops to be used as they are, or to be further elaborated. They are often found in caches or hoards where they were left by owners or traders. Some are slightly specialized, as 9 in the first line and i in the third line.

Quarry products at the transportation stage are necessarily not uniform in character. The blades, etc., accepted and carried away at one time may be ruder or less finished than those accepted and carried away at another time. In the third line, f, a reject from the quarry refuse may be more refined in shape than the transported and cached form g. Transporting and caching of raw material on the one hand and of finished implements on the other are not unknown, but caching was mainly the result of transporting and storing of roughed out implements in quantities not at once needed, and this was usually due no doubt to the intermittent nature of quarry production.

The right-hand column contains series of specialized forms, arrow-points, spear-points, knives, drills, etc., derived in the main as indicated in the genetic series. The smaller points were often made, no doubt, from small fragments or chips, but the process was essentially the same.

The process employed in roughing out and in the earlier stages of specialization was that of free-hand percussion with hammer-stones. The finishing was probably mainly by pressure with tools of bone.

The grouping as indicated by the braces should be carefully studied.


Not implements.
Implements.
Not transported.
Transported.
Rejects.
Cache forms.
Specialized forms.
Native Materials.
From quartzite bowlders.
From quartz pebbles.
Exotic Materials.
From rhyolite quarried from the mass.
From jasper quarried from the mass.
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 18 17
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 18 20 19
a b c d e f g h i j k l m n o q p
a b c d e f g h i j k l m o n q p

Origin, form-genesis, and distribution of the flaked stone implements of the tide-water region of Maryland and Virginia. The scale varies from 1-3 to 1-6.

PRIMITIVE REMAINS IN THE SAGINAW VALLEY, MICHIGAN.

[BY HARLAN. I. SMITH, SAGINAW, E. S., MICH.]

The Ayres Mound.

The Ayres Mound, as it has been called, was situated on the property of Mr. E. R. Ayres, about 60 feet north of the office of the Ayres Lumber Company, i. e., on lot 43, of the James Riley Reservation in the city of Saginaw, Michigan.

Although not a large mound this was a very typical example of the earth structures in the Saginaw Valley. It was about 34 feet in diameter and 18 inches in height; although there is no doubt that it had once been of a much greater altitude having since been slowly reduced by nature's forces. When first seen by the writer, in 1889, this mound, being covered with grass and flowers, had much the appearance of a neglected flower bed. It was of about the size and shape of the large round beds so common to the lawns of the adjacent premises.

The earth structures and in fact nearly all traces of primitive man in the valley, including village sites and open air work shops, were located near some water course. So it was with the Ayres Mound; it being built on the highest part of the ridge which lies parallel with the eastern bank of the Emerson Bayou at a point 280 feet from the natural bank of that body of water. The bayou, a branch of the Saginaw river having several small tributaries, was in early times a favorite place for hunting and fishing. Even of late years, ducks and similar game have frequented its borders, while its waters teemed with pickerel, bass, and other fine fish. With such attractions it is no wonder that the locality found favor in the eyes of the primitive people.

The part of the ridge, upon which the mound was built, lying between it and the bayou, is of a fine gravel overlying which is a dark sandy loam; while the part where the mound stood, and extending away from the water, is of clay over which the same rich surface soil is found, extending for some distance eastward. The spot is nearly always dry and the rich soil would produce in abundance those agricultural products which the early people of the valley were known to raise.

When the writer first visited this interesting locality the entire ridge was covered by an apparantly primeval forest of oak, elm, maple, walnut and other fine trees. On the nortwest edge of the mound itself stood an oak 7 ft. 4 in. in circumference, showing that the structure was of considerable age.

Mr. Chas. W. Grant, a neighboring resident, was the first to call attention to this mound. Previous to that time it had scarcely been noticed and it is not included in Prof. Cyrus Thomas' "Catalogue of Prehistoric Earthworks" recently issued from the bureau of Ethnology.

Permission to explore the work was granted by Mr. Ayres, the owner of the land upon which it was situated, early in April, 1892. The mound was then photographed, carefully measured and staked out preparatory to beginning the excavations. April 19 the excavation began in earnest. The workmen dug a trench, down to hard-pan, along the western edge of the southern half of the mound. This trench was then carried eastward, taking in the southern half of the work and going down to undisturbed soil; that is, all the soil and other materials that had been placed by the builders, were removed and carefully examined.

On arriving at the middle of the section it was found that there would not be time to complete the exploration at that visit, so a narrow trench was continued eastward through the center of the mound, in order to get a drawing of a cross section. Having thoroughly explored the southwest quarter of the mound and obtained a knowledge of the structure in cross section, we abandoned the work for that time just before sun down. On returning some months later to complete the exploration, we found that some "relic hunter" had dug over the entire mound. Further work on our part was therefore impossible, and we had to content ourselves with the results of our former exploration of a portion of the structure. So completely was this southwestern quarter of the mound examined that the results cannot fail to be of some scientific interest.

This mound, like many of the mounds we had opened, showed stratification. The first layer, just below the sod, was about 19 inches thick, and composed of a dark sandy muck which could not be distinguished from the surface soil of the surrounding woods. Below this was a layer, varying from 1 to 4 inches in thickness, composed of black soil partly burned and thickly mixed with charcoal particles. Between this layer of black material and the original surface of the clay below was a thin stratum of pure and white ashes. This stratum varied from a mere streak to a layer two inches in thickness. Intermingled in the ashes were some large pieces of charcoal, and below this ash layer was the original clay. It had been burned, almost to the hardness of brick in places. This burned layer of clay was about five inches thick at its maximum, and below it there were no indications of previous disturbance by human agencies. In the ash layer at a point about eight inches west of our center stake was found a single copper bead. This bead was about the size and shape of a small marble and was much corroded. Over eighty copper beads and several copper implements have been found in the immediate vicinity of this mound.

Ten feet west of the center stake and about 14 inches south, we discovered in the black layer a leaf-shaped implement and four feet south of this a fine scraper of chert was thrown out of the surface soil. In the black layer we found many pieces of diabase and other hard rock which showed unmistakable evidence of intense heat, being cracked and checked in every direction. Here too we found large pieces of chert concretions such as are found near Bay Port, Mich., and were so much used by the aborigines of this locality as a raw material from which to fashion their implements. These were all much burned. In the surface layer were found many pieces of this chert which had not been burned and which showed where flakes had been taken off for the manufacture of knives and arrow-points. All the chipped implements found in the mound or near it, were, without a doubt, fashioned from this same concretionary chert. Many scrapers and flake knives were also found in this surface layer, all showing concentric structure, and undoubtedly made of material from the region of Bay Port.

In the narrow trench, about 19 inches east of the center stake and in the black layer we found two fragments of pottery about one half inch in thickness, and coated with a black layer on what had been the inside of the pot, while the outer part was the color of yellow clay. The material was thickly mixed with quartz grains; and the outer surface of the dish had been ornamented with slight depressions, made with some sharp instrument, dotted all over the surface at regular intervals of about a quarter of an inch. In the surface layer, near the eastern border of the mound, a fragment of a finely polished celt was found. This had been made of a greenish colored argillite.

Such were the results of our exploration of the Ayres mound. From such results alone little can be known of its builders.

Several years ago workmen, while digging for the foundation of a salt block about 300 feet west from the mound and 180 feet from the bank of the bayou, came upon a number of human skeletons. These were at the unusual depth of over four feet, which was possibly due to the accumulation of soil above the old surface. This has been done in the vicinity by the piling up of the light sand by the wind in long dunes. Among these graves were found bear teeth, deer-bones, and culinary refuse in general. From the large number of fish-bones found, one might conclude that these people took advantage of the resources of this locality near the bayou and that much of their subsistence was obtained from its waters. It is a remarkable fact that no implements of defense or utensils for domestic use were discovered with the remains; while at the mound only 300 feet distant such objects were found in abundance.

The land of the vicinity is fast being built upon and the enterprise of the city is already encroaching upon the remaining monuments in the neighborhood. It is to be hoped that further exploration may be made before all traces of these early people have been obliterated. Many of the remains of the primitive American peoples, all over our country, have been destroyed not only in carrying out business enterprises, but also, 'tis pity, by ruthless "relic hunters".

It is, therefore, of great importance that in the future careful scientific examination be made of all such remains, that are in danger of destruction, and that the results of such exploration be preserved for future study and comparison. It is from such work only that we may hope to learn of the early American races.

STONE IMAGE OR IDOL.

The interesting relic here to be described is shown in figure 1, front and side views. It belongs to the collection of Dr. R. T. Miller, of South Bend, Ind. It was found by a sixteen-year-old son of Americus Bunch while plowing upon his farm one mile north of Lakeville, St. Joseph Co., Ind., June 20, 1884. The soil from which it was taken was low and marshy, and the image was in an inverted position. It is composed of a dark grey sand stone which is deeply pitted or weather-beaten showing evidence of age.

It is complete or all there ever was of it, excepting what time and the elements have worn away. It is eight and one half inches high.

The meditative and peaceful countenance of this object does not appear to show any Indian characteristics. The high cheek bones are wanting, and the nose although curved, does not show that prominence which distinguishes the Indian race. The face is square and broad, and the head short. It was perhaps made by that "peaceable short headed race" mentioned by Moorehead in his "Primitive Man in Ohio".

Mr· Tylor in his "Early History of Mankind" regards the presence of idols amongst uncivilized races as denoting not only the entity of a religious idea, but also the cooperation of something like art and imagination. Sir John Lubbuck, in his "Origin of Civilization", says: "The worship of idols characterizes a somewhat higher stage of human development." Col. C. C. Jones in his "Antiquities of the Southern Indians", confidently affirms that the Southern Indians or those of Georgia were not idol worshippers. He seems to recall himself on page 430 of his valuable work, and admits that subsequent investigations prove by the discovered presence of the images themselves, that at some time or other idol-worship of some sort was here practiced. Of all the Southern tribes most addicted to this kind of worship, the Natchez stand preeminent. An old writer, Pere le Petit, says: "The Natchez have a temple filled with idols. Their idols are images of men and women made of stone and baked clay".

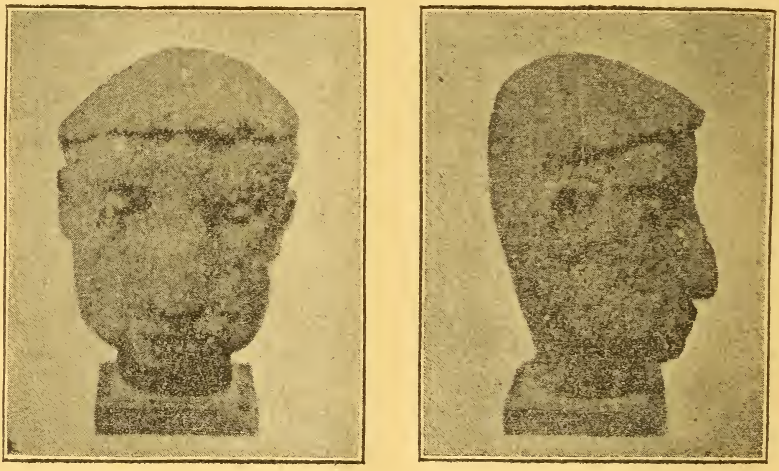


Figure 1.

The editor owns a baked clay head of grotesque form, about three inches high, found in Mississippi, probably made by these Indians. Through the face from cheek to cheek is a round perforation one quarter of an inch in diameter. The nose is fantastically turned upward, and the ears are more animal like than human. On top of the head is a perfect circle. They were worshippers of the Sun: their great chief was named after this star, and claimed that from it did he derive his origin. Undoubtedly true, for do we not all owe our beginning to this bright luminary? Think for one moment of the horrors a sudden extinction of our celestial orb would produce. To the untutored and savage mind was the disappearance of the sun a matter of awe. The cold produced in its departure caused death and suffering, for cold means death and heat life, which came again when the celestial stranger returned or rose in the heavens.

There was paid homage to the symbol which the great governor of the universe gave to his people for their welfare. May not then, this idol be a representation of that power, and the circle on the head of the clay image represent a sun symbol?

Dr. C. F. Causey, of Sartartia, Miss., is the owner of a very fine image nine inches high. It was found a short distance from where he lives. The Natchez too may have been the makers of it. We hope it may later on be figured in this journal. A. F. B.

KANSAS ARCHÆOLOGY.

Two Mounds in Atchison County.

[BY GEORGE J. REMSBERG.]

About five miles southeast of the city of Atchison, on a stream called Owl creek; is an old Indian village site. Such places are innumerable in Atchison county, but the one on Owl creek is probably the most extensive. The scope of the village covers an area of about five acres. The earth presents the appearance of having been burned in many places and is intermixed with fragments of pottery, chips of flint, bones of animals, and all kinds of broken and unfinished implements.

One day while visiting this old village site, the writer concluded that he would make further search, thinking there might be some mounds or graves in the vicinity. He climbed to the top of a lofty and rugged hill, directly opposite to the village site, and he had not searched a great while before his most sanguine expectations were fulfilled. On the projecting point of the bluff, overlooking the Missouri river, he discovered two mounds, about one hundred yards apart. He went home, procured a spade and pick, and with his two brothers and C. A. Bruner, again repaired to the scene of the mounds for the purpose of making excavation. At the depth of about two feet human bones were found. They were badly decomposed and only small pieces could be removed, and they would crumble instantly with the pressure of the finger and thumb. The bones had evidently been under the action of fire, for some of them were badly charred, and pieces of charcoal, burned earth, and stones showing marks of fire, were found among the remains. The writer sent some of the bones to the curator of archæology in the Smithsonian Institution, asking his opinion about them, and he replied that there was no evidence of the bones being burned. This gentleman is certainly mistaken. According to physiological research, if a bone is burned and all the animal matter be not consumed the bone will become black, while on the other hand, if the animal matter is all consumed the bone will retain its whiteness and can be crumbled into a plain white residue. If we accept the theory of physiology, which is a very reasonable one, we are ready to admit that the bones found in these mounds had been more or less burned.

The work of excavation was not finished the first day, our time being quite limited; but a few days afterwards the writer, in company with J. F. Oliphant, of Atchison, re-visited the mounds and resumed the work. No relics of importance were found. In one of them was found a small flint arrowpoint and another worked flint. In the other was found a broken spearhead and some chips of flint. The position of the bodies could not be correctly ascertained, as most of the bones had crumbled away, and what few remained were scattered around promiscously. It seems that they were buried without any attempt at regularity. In one of the mounds in the southeast corner was found a piece of jaw-bone containing a few teeth, and in the other a few fragments of charred skull were uncovered in the east end. Although only a matter of conjecture, yet it is reasonable to suppose that human sacrifices had there been offered, and after the bodies had been subjected to the action of fire without being entirely consumed, the remains were left in an irregular position and covered with earth and stones.

The mounds were about fifteen feet in diameter at the base, and about two feet in height. Each mound contained a stone vault measuring two by four feet. The stones which composed these vaults show unmistakable signs of fire. There was a layer of flat stones over the top of each vault, and also a layer of stones, forming a circle around the mounds at the base. The mounds, although they present an ancient appearance, cannot be ascertained how old they are. Such mounds are found at intervals along the bluffs of the Missouri river, all the way from Omaha to St. Louis.

ANCIENT PIPE FROM WEST VIRGINIA.

[BY L. V. MC WHORTER.]

The writer has in his collection of relics an ancient pipe resembling a certain type found by Squier and Davis in their explorations of mounds in the Ohio and Mississippi Valleys.

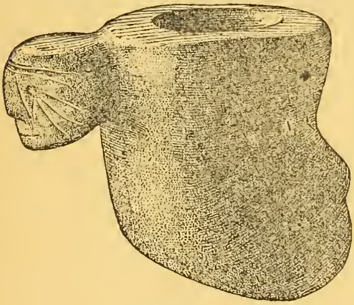


Figure 1.

This pipe, of which a full sized cut is shown in Fig. 1, is made of fine grit stone, moderately hard, of a blueish cast, and was found in a ploughed field near Willow Grove, Jackson County, West Virginia.

The perforations bear the usual characteristics of ancient pipes, viz: a wide opening with a gradual narrowing as they approach a point of juncture, that is, funnel shaped.

The pipe weighs one and three quarter ounces, and will hold about as much as a ladies good sized thimble.

But its most interesting feature is the human face and head projecting from the front of the bowl.

The eyes are simple dot like depressions. The nose is not prominent, apparently, having been to a certain extent, worn away, the natural sequent of long exposure to the elements. The mouth is represented by two distinct groove like depressions, below which is a small, yet well defined chin.

Radiating from a point at, and below each eye, and extending downward and outward in a fan like expansion over each cheek, are four lines or grooves. Two similar lines are draw horizontally across the entire breadth of the forehead. Starting at angles with the lower of these horizontal lines are two of like form which extend down either side of, and expand along the base of the nose to the upper lip. The marks on the cheeks, says Prof. Wm. H. Holmes, who examined this pipe, are "tear lines, a common thing in shell work." These lines certainly give to the face a sad and melancholly expression of countenance.

Sculptured pipes are found not only on the surface of the ground and ploughed fields, but in stone graves, and in the depths of the stupendous and mysterious mounds. In point of archæological interest they are not surpassed by any other form of relics left us by the unfortunate aborigines of America.

The caricature of the human visage portrayed in primitive sculpture, whether of individual characteristics or of racial types, will continue to be an object of more than special interest to the Anthropologist.

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EDITORIAL.

Display of Archæological Ignorance.

Recently was brought before the archæological public a privately printed pamphlet, so produced because, I suppose, no reputable publishing house would lend its name to the production, by one Francis Worcester Doughty, a member of "The American Numismatist and Archæological Society", of New York City, entitled, "Evidences of Man in the Drift." Its great absurdity causes the writer to notice it in this journal, and one is almost compelled, in glancing over its contents, to infer that the author has on the subject of the drift, with its accompanying so-called remains of man gone daft.

This numismatist, for he appears to know more about coins than he does of archæology, wishes his readers to believe that the drift which covers a large surface of the Northern Hemisphere was not caused by the great glaciers of geologists, but by a comet suddenly striking the Earth. He agrees with the theory of the Hon. Ignatius Donnelly, who, in his work, "Rag Narok, or The Age of Fire and Gravel," contends that the drift was really produced by such a collision.

Perhaps, Mr. Doughty, your works of art came with the comet? Like Mr. Donnelly, Mr. Doughty refers his readers to passages taken from the Bible to verify his statements. He appears to have gathered a large number of glacial nodules and pebbles and clay stones containing iron, and because of strange shape and having on them different colors caused by chemical action wants to make it appear that they are remains of human art. The iron stones are to him "not natural concretions but archæological objects of the highest interest". "Hundreds of them more critically examined failed to produce one unmarked by the hand of man."

To him, or according to his theory, have human hands living in the Tertiary period of geological time painted his precious iron-stone nodules red, yellow, purple, blue, green, black, white and brown. Not only did they know how to use all these colors: but they had a way of marking their stones, proving that they also had an alphabet. Where, oh where! are the upholders of the theory of the degeneration of the human race? Verily, in Mr. Doughty they will find a most desirable champion. He has found principally the shape of the human head both full faces and in profiles. The features of some are Indian with feathered head dresses: then the Caucasian type "often heavily bearded and of different styles of cuts."

The features of the negro are also present, painted black, and too the Celt with "heavy red beard and mustache". The forms of the dog, horse, sheep, rabbit, black-bear, wolf, man-like-ape, elephant, green-adder, parrot, smaller birds and dolphin or whale are also present.

On stones which he calls tablets are

represented human and animal forms in groups, and one, he says, shows "a man with Caucasian features sitting in the presence of several highly colored individuals who approach him with bowed heads. In each instance either the seated figure holds a staff bearing the head of a serpent, or the staff is held before or behind him by another. The seated figure always wears a most elaborate feathered crown, resembling that worn by the Palenque figures."

These highly cultured (?) painters followed the Chinese style of coloring. "The artists of the drift like the Chinese had do idea of perspective, but were possessed of another idea termed space economy. The large figures are made up of many smaller ones, and the designs hard to decipher. Thus one figure contains many. A foot in one group is liable to serve as a head in another: the arm of one becomes the leg of another, and so on through a perplexing infinity of detail seemingly hopeless at first, but after a little patient study easily understood".

Our author says "it is hard to understand such artistic methods". For the first time does the writer agree with him, and, I am certain my readers will be of the same opinion.

Here is another point of peculiar importance which "must be touched upon". "Many of the tablets contain a layer of clay through the centre, off from which the top can always be lifted by a slight tap on the side, or by applying the thumbnail to a frequently occurring indentation. This interior layer of clay presents a second face as perfect as the first, and in every case is found worked up with figures or painted. The bond of union is sometimes a shoulder of harder clay to which the top leaf has been cemented, but oftener the same blackish substance already alluded to. In many instances of the larger tablets these leaves are not fastened together at all, although matching each other perfectly. In such cases all sides are worked up into pictures, and a glance is sufficient to show that no permanent union ever could have existed between the leaves. Single leaves are sometimes found. Still another point is that in all the smaller tablets there are slots, finger holes cut, which not only adjust themselves to a man's hand, but are invariably arranged in such a manner that the finished face is exposed when the tablet is held. Many of the tablets are finished on both sides, others have one side left rough." One of these wonderful books was exhibited before the society while delivering this ridiculous piece of nonsense.

He claims to have taken from this cometary drift a sculptured human head weighing 600 pounds, and, most wonderful! predicts that the "old man of the mountain", that freak of the elements in the mountains of New Hampshire, cut into the form of a gigantic human profile will be found to be nothing more than the idea of the sphynx and pyramid worked out in colossal size untold ages ago by the men of the drift. What a wonderful folk these drift people must have been! They even made coins: at least so we are told by this numismatist for he found them.

The production of eighteen pages is filled from first to last with the most absurd and ridiculous statements, assertions a true archæologist would not for a moment give a thought, and much less print. It may therefore be asked why so much space has been given to this freak which would be worthy of a place in some second rate dime museum. Simply to warn those who may in the future become possessed of it, that it is the manifestation of a careless anventurer's ignorance, a misconception from title page to last, and written by one who, in his wild imagining, thinks, without valid reason, he sees in glacial and rolled stones remains of human art, when indeed they are but the result of Earth's elements and chemical action. A publication of this stamp certainly does a great amount of injury, and, both writer and his unwise publication should be suppressed. A. F. BERLIN.

CORRESPONDENCE.

Scrapers and Gunflints.

ED. ARCHÆOLOGIST:

Most collectors have, no doubt, like myself, had their attention called to the similarity of the so-called scrapers, to the ancient gunflints. In fact the difference is so slight that in some cases it is almost impossible to tell one from the other. Both have the same flat face, the rounded back, and the delicately chipped edge: and then the size is in most cases nearly the same. In looking over some forty specimens in my collection, I find but a slight variation in size and shape, the largest being ½ by ⅞ of an inch, and the smallest ½ by ¾ of an inch. Most of them are finished only on one edge, though a few of the smaller ones have all four edges neatly beveled; I think this form is not common.

Now, I have given this subject some attention, and I have often wondered if many, if not all of the scrapers, were not intended by the Indians to be used as gunflints. After this country was settled by the Whites, many of the Indians obtained flint-lock guns. In course of time the flints were either lost or broken, and the gun was useless. In that case what would be more natural than for the owner to try to make some substitute? and not having the proper flint to take the material most convenient, that would best serve his ends. Some of my specimens from West Virginia are of chirt, but here in eastern Massachusetts I find them of nearly every kind of stone that an arrowpoint could be made from, porphyry, felcite, and quartz. It would be strange if a man capable of making the fine and delicate arrow, the finished gouge and celts, the grooved axe and hammered pestle, should be obliged to lose the use of his gun for the want of a flint. I should lose much of my respect for his skill if I thought him incapable of finding a substitute. He was not the Yankee that I take him for if he did not make something that would answer his purpose. Nearly every piece that I have was found in the fields where relics were most plenty. One fine flint was taken from the edge of a shell-heap on the Maine coast. While near there I found arrows of the Kineo flints.

I have never found any trace of use on the finely chipped edge of either scraper or flint: that being evidently the edge that was fastened in the gun, while the other, or thin edge, shows mark of much use. In fact from their form they would seem to be better suited to use in a gun than to be held in the hand, and used to scrape with.

CHARLES A. PERKINS.

Jan. 26, 1893.

NOTES.

The Canstatt and Neanderthal Skulls.

Even in some very late treatises on archæology and ethnology I observe that there is still talk of the "race of Canstatt" and the "race of Neanderthal," these imaginary races of ancient Europe being supposed to be represented by the skulls found in those respective localities. The late M. de Quatrefages was, I believe, responsible for the erection of these skulls into "types", and for the theories of prehistoric ethnography based upon them.

It should be recognized, once for all, that there is no sort of foundation for these scientific dreams. In neither instance did the locality in which these skulls were found guarantee them any high antiquity. The Canstatt skull was unearthed along with Roman pottery. and in all probability belonged to the fourth or fifth century, A. D. The Neanderthal skull, on which still greater stress has been laid, and casts of which are to be seen in most archæological museums, was not dug up at all, but was picked up in a gully which had been washed in the mountain side, and came from dear knows where. Probably there had been an old graveyard farther up the hill, but by no means one in quaternary times. The fragment, moreover, is so fragmentary, and presents such evident signs of pathologic processes, that it is more than daring to assume it as the typical cranium of any race.

These and many allied facts in the same direction were admirably brought out in a discussion last August at the meeting of the German Anthropological Assocaition by such speakers as Von Holder, Virchow, Kollman, and Fraas. Their arguments leave no room to doubt the unimportance of these remains.

* * *

The Co-Existence of the Mammoth and Man.

Not long since; the distinguished and venerable archæologist, J. Steenstrup, of Copenhagen, published a paper examining the discoveries in Europe which are supposed to prove the contemporaneity of man with the mammoth: and reached the conclusion that not only is the evidence inadequate, but for climatic and geologic reasons no such co-existence was possible.

At the last meeting of the German Anthropological Association Professor Virchow quoted Steenstrup's conclusion and endorsed it, as did also others present. The "reindeer period" was the remotest to which they were willing to assign the appearance of man in Europe on existing evidence. The artefacts of mammoth teeth and bones found in the caves were asserted to be from fossil remains picked up by the cave men. Where such artefacts are found in gravels along with mammoth bones, they would say that these gravels are themselves posterior to the reindeer period, and hence contain objects of various preceding periods.

There remains for consideration the delineation of a mammoth on a bone from the Lena cave in the south of France. This was but discussed, being probably considered of questionable origin. In the United States two such delineations have been brought forward. They are both strikingly similar to this French original, which has long been made familiar to American readers through various publications. Both proceed from the valley of the Delaware river. One is on shell and one on stone. I have examined both originals very carefully, and apart from the vagueness which surrounds the finding of both, for purely technical reasons I believe both to be recent. There still lacks conclusive evidence that man and the mammoth were contemporaneous in the area of the United States.—Dr. D. G. Brinton, in Science, No. 523, p. 79, February 16, 1893.

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The Archæologist.

VOL. I. WATERLOO, INDIANA, APRIL, 1893. NO. 4.

ANCIENT VILLAGE SITES ALONG THE DELAWARE RIVER AND DURHAM CREEK.

[BY CHARLES LAUBACH.]

The subject of ancient villages and residences is one which we believe will interest some of our readers. We propose to treat it in connection with the Delaware river sand and gravel deposits, and the archæological significance of the latter. Although not a new theme to us, some new material has accumulated which has a tendency to establish our earlier assertions in this line more firmly; hence we desire to put the old and new forth.

The prevailence of village life among prehistoric man, before the advent of the European will probably not be disputed, yet we shall go over a few facts to show that it did exist.

History and tradition furnish ample proof that this custom prevailed among the later Indian tribes. They had their favorite places of shade, although at times they may have spent their time in temporary encampments. The succession of races betokened by the relics found at great depths. as well as on the surface and intermediate positions, show that village life existed through all periods.

The relics found at great depth are not usually of the same material nor finish as those left by tribes, after the advent of the white man, yet they are often found in the vicinity of villages known to have been occupied by the later Indians, even as late as 1700, showing that prehistoric man occupied the same localities as a place of residence. Prehistoric man roamed the forests and streams in quest of game and fish. while the later Indians added agriculture, to augment their food supply.

The identification of prehistoric village sites is a somewhat difficult thing to do, yet it has been done in several cases in this. as well as in other localities. There are many places in this vicinity where villages are known to have existed, and in some of these localities relics and fire-burnt stones have been found deep underground in a geological position denoting great age. This would indicate that near the same spot in an earlier epoch ancient man also had their abode. Several such localities have from time to time come to the notice of the writer. of which we, in this article. will endeavor to describe three. One at Coffeetown, at the junction of Frey's Run with the Delaware river: another at Riegelsville. on the west bank of the Delaware river; and another at Morgantown, on the north bank of Durham creek, where a small stream (Brandywine) empties into the aforesaid stream.

It may be worthy of notice that prehistoric man as well as the later Indian and European. all apparently selected the same spot for their homes. The beautiful in nature attracted the untutored savage as well as the more civilized white population. as the villages and towns now occupying the same spots testify. The same appreciation of natural advantages existed among all races in every epoch.

It is noticable that all the ancient village sites are near lakes or streams where game was known to abound. The relics of the Indians scattered over the surface are in most localities more numerous than those found at a greater depth; this no doubt is owing to the fact that primitive man's needs were few.

We propose describing the villages in their order:

I. The first or Coffeetown village, located on the western banks of the Delaware river, in Northampton Co., Pa., extending from the northern base of the second spur of the South mountains, across Frey's Run, a distance of over half a mile. The spot was long known to collectors of Indian relics. This was the site of an Indian village at the time of the first settlement of the place. Tradition tells us that an Indian trail was discernable in early times leading across the mountain to the Durham meadow, where the Indians often met around their council fires. The trail has disappeared, and a public highway now occupies the route across the mountain, diverging to the right on its southern side. The place is interesting because it shows that the same locality was occupied at two widely separate times.

1st. The relics of the later Indians may here be found scattered over the surface, and through the soil to a depth of over two feet.

2d. Relics and fire places, burnt stones and charcoal are found twelve feet under the surface, lying directly on limestone soil. The covering being post glacial sand and gravel. Height above present river level, fifty feet, and distant from the river one hundred yards. The hearths and relics were exposed a few years ago, by quarrymen while quarrying sand for building purposes. Covering the hearths is a fine alluvial deposit three feet thick, on which rest eight feet of alternate sand and layers of gravel capped by a foot of sandy soil. The hearths are of small boulders, covering an area of several square feet; charcoal was found covering the hearths and near by in the debris a number of stone implements, of argillite, steatite and flint.

Prof. Holmes, chief of the U. S. geological survey accompanied by Prof. Salisbury, H. C. Mercer, Esq., and the writer, visited this locality in September last, and we refer the reader to the forthcoming report by Mr. Mercer, for a full and detailed description of this interesting spot.

II. The second location where an Indian village existed, and where abundant evidence is at hand to prove that a prehistoric people once occupied the same site, is at Riegelsville, Bucks Co., Pa., on the west bank of the Delaware river, extending north and south a distance of nearly a mile. On the same side of the river, a mile west were located a group of mounds, destroyed in 1865, the object of which is unknown. The mounds were from twenty-five to thirty feet in diameter, and six to eight in height. They were probably used as observatories, judging from the excellent view obtained here over the surrounding country. The Indian trail leading from the village on the river across the intervening space being discernible in earlier years.

After the freshet in the Delaware river, June, 1862, which worked away a considerable portion of the later Indian village, and at the same time uncovered a portion of a prehistoric dwelling place the writer picked out of the solid embankment, at a depth of not less than thirty feet from the surface, a large number of stone implements of argillite, such as spear-heads, arrow-points, etc. We do not remember finding a single relic of jasper at this depth, but numerous burnt and fire-broken boulders used for hearths by these primitive people. Before the freshet we picket up several hundred weight of stone implements from the surface; many of which can be seen in the Dr. Swift collection, Pardee Hall, Easton, Pa., and in the extensive and valuable collection of Mr. A. F. Berlin, Allentown, Pa., and in the writer's collection in the museum of American Archæology University of Pennsylvania, Philadelphia.

III. The third locality where undoubted evidence of the existence of an earlier people than the later Indians has been discoved is at Morgantown, on the north bank of Durham creek, about a mile west from the Delaware river on the farm belonging to the writer. This site is specially worthy of consideration, owing to the fact that the place was occupied by a people whose history is lost in the mist of antiquity; and further that the place ages afterwards was again the resort of the later jasper implement manufacturers. It is located on an alluvial plateau of pre-moraine (Columbian) gravel, twenty feet above the water of Durham creek, extending along said creek a distance of 500 yards to the Brandywine, where it turns an angle following the course of the latter stream and valley about one half mile. When the site was first put under cultivation in 1865 by the writer, several small mound-like caches were unearthed containing rude implements of argillite. The mounds were lined inside with small boulders the whole covered with about twelve inches of soil. Over the surface were strewn numerous implements of jasper, also fire places and hearth utilized by the later Indians. At the extreme eastern end of this site, a limestone quarry was opened in the fall of 1886. In opening the quarry it was found necessary to dig away quite a large portion of this glacial gravel and debris: after driving an open cut into the gravel a distance of about fifty feet, and a perpendicular front or breast of 18 to 20 feet of gravel, against the limestone formation, the quarrymen came upon a circular hearth composed pincipally of potsdam sandstones, and a few boulders, fire-burnt and splintered; a few rude, but dubious stone implements were found here, but the hearth was undoubtedly artificial.

At the extreme northern end of this site while a force of workmen in 1891 were digging a well several hammer stones were unearthed. The chipping around the edges of the implements was beyond questions the work of some human being and the position where the relics were found denoted great age in an archæological point of view. The glacial deposit at this spot is twenty five feet in thickness, the implements were found at a depth of twenty feet from the surface. Northeast of this locality about 500 yards was, until recently, a small lakelet now already filled up, around which many rude relics were picked up, most of which showed distinctive features of manufacture.

A recent and an early period are here evident. Everything relating to the manufacture of the implements: their geological position, where found, etc.,—in fact everything on the one hand pointing to a recent and not long continued abode in the spot by the later Indians; on the other hand, the great antiquity of man's existence in the valley of the Delaware.

The explorations of the glacial gravels in the Delaware valley, have brought to light considerable evidence to show that a race of men existed in this valley in pre-glacial times, and that the implements found buried in these gravels were lost by that ancient peoples. Here they roamed the primeval forests, and fished in the ancient lakes and rivers. Here they fixed their abode for the living, and the burning place for their dead, whose ashes were buried with elaborate ceremonies.

"MAN AND HIS WORKS" AT THE WORLD'S COLUMBIAN EXPOSITION.

Supplementary to "American Antiquities at the World's Columbian Exposition." which appeared as a reprint in THE ARCHÆOLOGIST, Vol. I, No. 2, February, 1893.

It will doubtless be of interest to note the recent change in the location of the collections and other indoor exhibits of the Department of Ethnology.

Applications were made to the various departments of the Exposition for much more space than it was possible to grant. Perhaps it was this that led to the suggestion for another new building.—this now being erected upon the fair grounds is 415 feet long by 225 feet wide, and is to be known as the "Anthropological Building."

In it will be exhibited the archæological collections. and in fact all of the objects coming under division "M," that. according to the original plan. and as stated in the reprint, to which previous reference has been made. would otherwise have been placed in the gallery of the building of Manufactures and Liberal Arts.

The motto. "Man and His Works" will adorn this new building in which so much will be shown to illustrate the evolution of humanity on this hemisphere. American Anthropologists will surely be well pleased to have a building with a name covering all the sections of Division "M". and that acknowledges pure science on the Exposition grounds. especiallay in a branch which. although recognized as an important study in Europe. has only of late become so considered in this country. Prof. F. W. Putnam will now have a building for his department and will thus be able to much more satisfactorily illustrate the bearings and relationships of the various exhibits included in that department than would have been possible as it was formerly arranged. Moreover the new building adjoins the Ethnographical exhibit. which will form such an interesting part of the exhibition under the charge of Prof. Putnam. Now the exhibits of the entire department will be together. whereas. according to the previous plan the collections would have been at some distance from the out-door villages of native peoples.

On approaching the Anthropological building the visitor will pass through these villages of natives. all engaged in their work, and thus exemplifying their true native customs and modes of living. Following on along the shore of the south pond the visitor will pass the canoes of the various coast peoples. and will have a chance to see the curious fishing tackle used by them.

Just before entering the building he will view the reproduced ruins of Yucatan. These reproductions were made under the direction of Mr. E. H. Thompson, U. S. Consul to Yucatan. from moulds taken by him at the ruins last year. Mr. Thompson has returned to Yucatan from where he will send some tropical vines and to be placed on and about the reproductions of these ruins. This will give to them a very beautiful appearance in addition to the great archæological interest which they will call forth.

Here will also be seen casts of idols. inscriptions. etc.. taken at Copan by the Peabody Museum, Honduras expedition under the direction of Mr. Owens. On entering the building the collections will be seen arranged in cases and on the walls.

In the northern end of the gallery will be established a laboratory of Physical Anthropology. Here the visitor may have his measurements taken and see his place on the charts illustrating anthropometry.

One of the most interesting features of the exhibit of this department, especially to anthropologists, will be a library of the literature bearing directly on Anthropology. This library will be nicely arranged in a room entirely devoted to it, and will be under the charge of assistants of the department, who will give information in regard to the various books, pamphlets, etc.. and will allow the visitors to examine the same.

A catalogue of this library will be prepared as soon as possible, referring to both subject and author. This catalogue will serve as a book of reference and bibliography, and will be of great value to those who are interested in Anthropology. At the close of the Exposition the library will be placed in the Memorial museum of Science to be established in Chicago as a permanent museum. It is possible that some of the collections made by Dept. "M" will also be turned over to this new museum or by the Exposition authorities after the close of the fair.

From first to last the exhibits of this department will be arranged to teach a lesson and to be an aid to science. They will show the evolution of man and the various relations of the men of the present time.

There can be no doubt that this showing of the real uses of anthropology as a practical study will do much to establish its recognition in the educational institutions of this country. HARLAN I. SMITH, Saginaw. (E. S.,) Mich.

CHICAGO. March 5. 1893.

◆

STORY OF A FORT NEAR MUIR, MICHIGAN.

In connection with the excavations of Indian burial mounds at Muir, a description of the fort, said to have been constructed by the "Lost Tribe" therein referred to, will not be amiss.

The fort is within half a mile from the village. It still retains the original intrenchment, which is in many places from three to five feet in depth, and its outlines are plainly discernible. The outer embankment, where the dirt was thrown out of the ditch, is fully six feet over the natural hill level, and oak trees that indicate an age of from 350 to 375 years, grow on its top. Within the line of defense is a comparatively level surface, or plateau, 235 feet in the greatest length, by nearly 150 in width, having a mean elevation above the water flowing at its base, of from 90 to 115 feet.

The Maple river, with its small tributary stream, forms a natural boundary to the hill for about seven-eighths of its circuit. The remaining distance is a very abrupt slope, extending eastward in a series of low sand, foot hills, in which thousands of flint chips and arrow-heads are found by any one searching for Indian relics.

The highest part of the enclosure is the eastern end, where about one-half the plateau is separated from the rest by means of an inner trench that joins the outer trenches, so as to form a nearly circular piece of ground. Then at a distance ranging from 45 to 60 feet, is found a second division, or inner defence against the western extremity. Both inside trenches still show a depression of from one to three feet deep, thus forming three unequal divisions of the fort proper, in which, traditions and Indian legends tell us, an entire tribe of warlike Indians was exterminated.

These legends and traditions inform us that about four centuries ago, or about the time this country was discovered, a tribe of Indians from near where the "great rushing waters" join (probably the Ohio and Mississippi rivers) began a war of plunder on a stronger tribe, further to the south (thought to be in Arkansas and Texas), which tribe retaliated by chasing them not only home, but a long distance further north, fighting all the time until the head waters of Lake Michigan were reached, where a stand was made, and a winter passed. The spring, however, found the southern tribe back again, strongly reinforced, compelling the besieged tribe to retreat still further northeastward, until late in the fall, on reaching this hill, the latter decided in council, to retreat no further, and in a single day and night threw up these breastworks that yet speak of good engineering skill in undying language. Here they considered themselves capable of withstanding any kind of siege, and in fact they easily did hold at bay their enemies, who were utterly unable to ascend the well-defended hillsides. Soon the besieging tribe retreated southward, defeated, yet not conquered.

Finding themselves free at last from molestations and feeling secure in their fortifications, they began wars for scalps and plunder on the small Indian tribes in the surrounding country, carrying death and devastation everywhere, and taking all food found into their home, or hill fort, until they become, in very truth, monarchs of all they surveyed.

The spring found them with a full supply of dried food, while their hunters had but to go forth and slay, to provide fresh meat in plenty, and as the springs and streams at the base of their hill furnished them a never-failing supply of purest water, they felt little or no apprehension of the danger that menaced them. But in the early spring their enemies appeared before them once more, with new determination and largely increased forces.

The "lost tribe" retreated within the fort and cast defiance at their enemies, their supply of food sufficient to last until the approach of winter would drive their warmer-blooded foes back again to their sunny, southern homes. But so fierce and watchful were the Indians who had surrounded them, that none from within the fort might go down to the water for a drink, and return alive, as every one making the attempt was killed, by arrows in the day and tomahawks at night.

Seven suns passed over besieged and besiegers alike, when during the night of the seventh day the watchful warriors outside saw hundreds of dead bodies rolled down the southeastern bank, where they splashed into the water, for the want of which people were dying by hundreds daily.

This state of affairs lasted another four days, until none inside were strong enough to cast out their dead. The besiegers waited yet another day, and then they stormed the fort in a united rush up the hill and over the embankment. This unresisted horde of savages were the only living things on the plateau, saving a score or so of the most hardy warriors, who were more dead than alive from thirst: and yet a more terrible death awaited them, for in accordance with that refinement of cruelty inherent in the savage breast, these survivors were given drink and food to preserve them for the slower death of torture that awaited them. Their sufferings terminated the second day after having been captured. Thus miserably perished this entire tribe, variously estimated at from 2,000 to 6,000 people.

Traditions of the past inform us that this exterminated tribe buried their dead in moon-shaped mounds, making a covering for them, through which not even the ground hog could burrow; that they kept a watch fire burning on these graves for one moon, when fresh dirt was thrown over the ashes, hiding them from sight of all living men. This hill, as well as the entire surrounding country was deserted by Indians of all tribes, who held the hill in awe and fear, but traditions kept alive these legends of the annihilated tribe.

Other traditions told how the children of the neighboring tribes, captured in war or stolen by stealth, were killed, then cooked in large hollow stones, and eaten by this peculiar race of unknown aborigines.

Whatever share of truth may be in all these traditions, some facts seem to confirm the stories, such as the ancient appearance of the fort itself and the already excavated moon-shaped burial mound with its fire-baked covering. Beneath the mounds of dirt, thrown out when digging the trench of the fort defense, have been found remains of large earthenware dishes or receptacles, one 10 inches, the other over 36 inches in diameter, the small one burned on the inside only, as though having been used as an incense burner, while the large one was burned only on the outside, making plausible the stories of cannibalism, practiced by this unknown and lost tribe, the formation of whose very jaw-bones and arrangement of teeth show them to have been a race of flesh-eaters. The whole truth about this exterminated tribe can never be known.—Detroit News, Feb. 25, 1893.

FLINT KNIVES.

[BY J. R. NISSLEY.]

Savage man, although he could bring to the ground his game with spear, lance and arrow-head, found that in skinning and cutting it he needed an implement which would as well serve in its place as did his other utensils. He was not long, therefore, in producing an instrument which, attached to a short handle of wood, and perhaps often of bone, served exceedingly well as a knife. My reference to handles of bone is caused by the discovery in 1884, in the Mariott mound, No. 1, Little Miami Valley, by Dr. Metz and Prof. F. W. Putnam, often points of deer antlers grooved so that they were perhaps used as handles for stone knives. Thomas Wilson, curator of the archæological department in the Smithsonian Institution, writes as follows of these handles, on page 640 in the Smithsonian Report, National Museum, 1888: "Of the ten handles one had a piece of bone inserted for a cutting or piercing implement, and another a bit of worked flint, but it was triangular and had no relation to the leaf shaped implements, and was to be classed among the arrow-heads of common form." These knife and dagger like objects are found wherever the Indian made his home. They are of different forms and sizes. Some have a knife-like appearance, some are leaf-shaped, while others are stemmed as are many spear and arrow-points.

Uneducated collectors class such forms into spear and arrow-heads, without taking into consideration that were they as arrows shot from the bow they would carry but a short distance. The writer contends that it was only the very light, small and slender implements that served as the tip of an arrow.

Here again we are at a loss to exactly classify the smaller objects. I quote from Mr. Charles Rau's Smithsonian contributions to Knowledge, No. 282, p. 2, who says: "Collectors, for instance, are very ready to class chipped stone articles of certain forms occuring throughout the United States as arrow and lance heads, without thinking that many of these specimens may have been quite differently employed by the aborigines. Thus the Pai—Utes of southern Utah—use to this day chipped flint blades, identical in shape with those that are usually called arrow and spear points, as knives, fastening them in short wooden handles by means af a black resinous substance. * * * The writer was informed by Major Powell that these persons use their stone knives with great effect, especially in cutting leather. On the other hand, the stone tipped arrows still made by various Indian tribes are mostly provided with small slender points, generally less than an inch in length and seldom exceeding an inch and a half, as examplified by many specimens of modern arrows in the Smithsonian collection. If these facts be deemed conclusive, it would follow that the real Indian arrow-head was comparatively small and that the larger specimens classed as arrowheads and not a few of the so-called spear points were originally set in handles and were used as knives and daggers." Dr. Rau wrote this in 1876.

For the consideration of his readers the writer figures in this paper four very interesting specimens which may be termed knives.

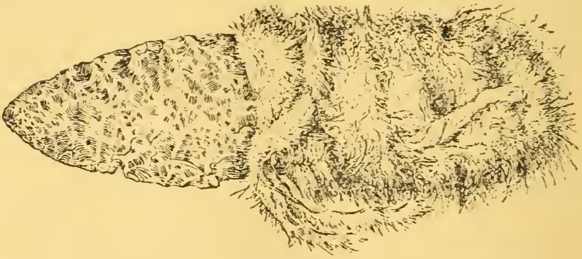


Fig. 1.

Fig. 1 shown here is made from obsidian. Around one end of it is wrapped a piece of otter skin. Obsidian can be chipped into a very sharp edge. We are told by a Mexican historian that the Aztecs sharpened by chipping this material into a razor-like edge with which they shaved themselves. With it also did the Aztec priests immolate their victims, by cutting open their breasts and tearing out their hearts. The historian Clavigero in his History of Mexico, bk. 8, p. 367, says: "The Maquahuitt, called by the Spaniards spada, or sword, as it was the weapon among the Mexicans which was equivalent to the sword of the old continent, was a stout stick, three and a half feet long and about four inches broad, armed on each side with a sort of razors of the stone itzli—obsidian—extraordinarily sharp, fixed and firmly fastened to the stick with gum-lac, which were about three inches long, one or two broad, and as thick as the blade of our ancient swords. This weapon was so keen that once it entirely beheaded a horse at one stroke, occording to the affirmation of Acosta: but the first stroke only was to be feared: for the razors became soon blunt. They tied this weapon by a string to their arm, lest they might lose it in any violent conflict." The original shown is in the collection of the U. S. National Museum at Washington, D. C., Cat. No. 126.536. It is also figured on plate opposite page 640. Rep. National Museum, 1888, by Mr. Thomas Wilson, curator.

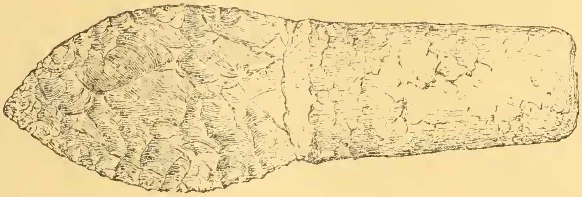


Fig. 2

We have in Fig. 2 an implement fastened with bitumen into a wooden handle. It is finely chipped and appears to belong to the leaf-shaped pattern. It is made from jasper. Although jasper can be chipped into a pretty sharp edge, it is inferior as a cutting tool to the volcanic glass or obsidian implement shown in first cut. Its catalogue number is 126.527, is in same museum as Fig. 1, and also described by Mr. Wilson.

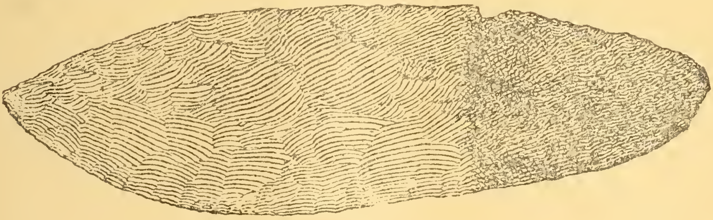


Fig. 3

Fig. 3, an elongated pattern is shown by Gates P. Thurston on p. 229 of his "Antiquities of Tennessee." One end shows a mottled appearance caused by the glue, no doubt, in hafting. The author tells us it is made from flint and is two-thirds natural size.

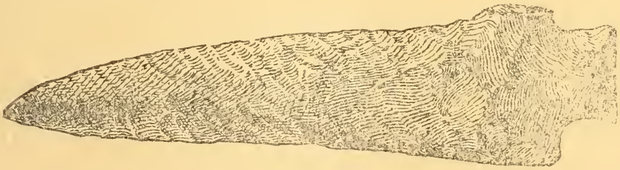


Fig. 4.

Fig. 4 differs from the preceding specimens in being stemmed. It appears to be nicely chipped and to have a sharp edge. Still it may have been used as a dagger or spear-head. There is nothing to show that it only served as a knife. The writer is inclined to believe that it served more for use in close encounters, which would bring it under the head of daggers. That the aborigines knew well the use of such implements can not be doubted for a moment. There is to be seen in the Smithsonian collection a beautiful object, dagger-shaped, having a well-wrought handle, found in a mound in Alabama. The flint daggers of the prehistoric Scandinavians are chipped but little better. This relic of flint is also in Gen. Thurston's cabinent, at Nashville, Tenn., and is two-thirds natural size.

INDIAN BOWS AND ARROWS.

[BY THE LATE GEN. JAS. S. BRISBIN, U. S. A.]

[From "Golden Days," Feb. 11, '93: P 180,]

The bow, so long in use by the Indian tribes of America, so typical of savage life, and the mere mention of which brings to our minds ideas of red men, is of various kinds of wood, and its manufacture is a work of no little labor.

The bow is much used, even at this day, and although an Indian may have a gun, he is hardly ever found without his long bow and a quiver full of arrows. The gun may get out of order, and then he cannot mend it: but if his bow breaks, he can easily repair it. The amunition may get wet, and there is an end of it: but the bow is always in order, and its swift arrows will go straight to the mark, in wet weather as well as dry. The savage thus reasons, and so keeps his bow to fall back upon in case of need.

Until breech-loaders were made, it is a fact well known that the bow was far more deadly at close range than the best rifle. An Indian could discharge his arrows with greater rapidity and precision, much faster, indeed, than the most expert woodsman or soldier could charge and fire a muzzle-loading gun.

The age of the bow is so great that its origin perhaps is as old as war itself. It is painted on the ruins of Nineveh: it is mentioned in the first book of the Bible, and is known to have been used on the eastern shore of the Mediterranean Sea, where the human race had its origin.

The first lesson of the Indian is to learn to shoot with the bow. He is given a small bow and "beewaks," or blunt arrows, so he will hurt nobody: and with these he shoots at marks. By-and-by, when he has got some skill in handling his bow, he is given small arrow-points, and with these he shoots squirrels, birds and small beasts. When he grows older he receives a long bow, and at last a strong, or war bow.

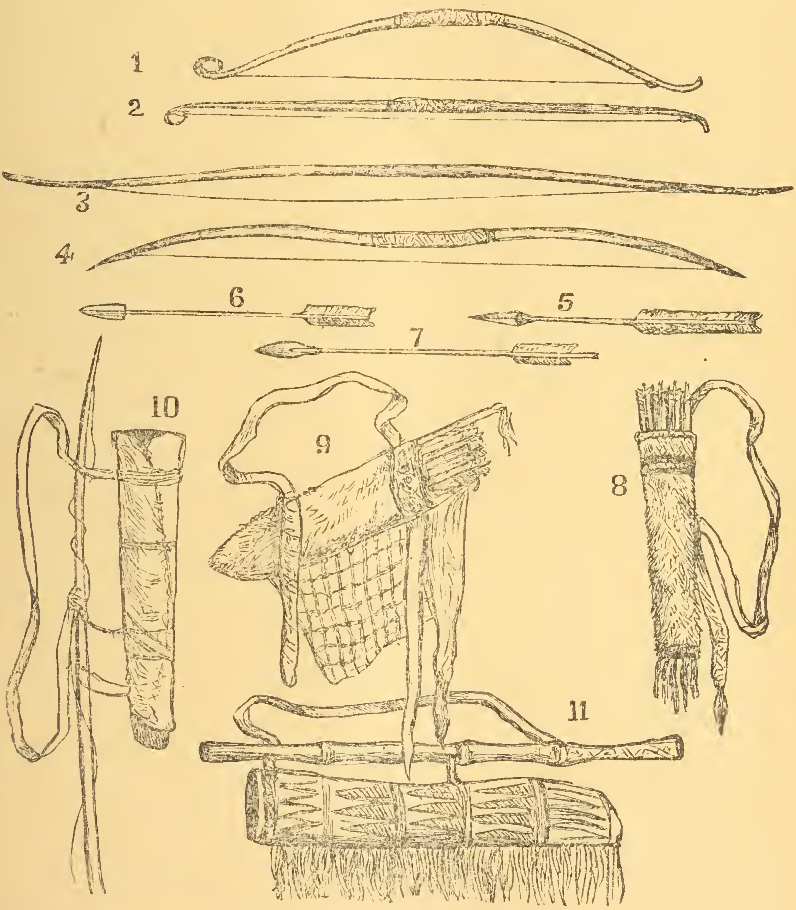
The strong bow is a powerful weapon, and some of them are so stiff that a white man cannot bend them more than four inches, while an Indian will, with apparent ease, draw them to the arrow's head.

A shaft fired from one of these bows will go clear through the body of a buffalo, and arrow-heads have been found so firmly imbedded in the thigh bones of a man, that no force could extract them.

Indian fathers take great pride in teaching the young Indians how to shoot, and the developement of the muscles and strength of their arms is watched with much interest. A stout arm, ornamented with knots of muscles, is a great honor to an Indian, and no one but those who can handle with ease a strong bow is deemed fit to go to war.

The Sioux and Crows make the best bows of all the Indians in the West. The Sioux bow is about four feet long, one and a half inches wide, and an inch thick at the middle. It tapers from the center or grasp toward each end, and is but half an inch wide and half an inch thich at the ends. At one end the bow-string is notched into the wood and made fast, while at the other end two notches are cut in the wood, and the string is then made like a slip knot or loop.

When the bow is to be used, the warrior sets the end to which the string is made fast on the ground, and then bends down the other end until the loop slips into the notch. This is called "stringing" the bow.



1. Bow strung.
2. Bow unstrung.
3. Long bow.
4. Fancy bow.
5. War arrow.
6. Game arrow.
7. Long arrow.
8. War quiver.
9. War quiver.
10. Long arrow. quiver and bow.
11. Fancy quiver.

Bows are never kept strung except when in actual use, as they would lose their strength and elasticity by being bent all the time. When unstrung, a good bow is perfectly straight, and, if properly seasoned, will always retain its elasticity and straightness.

The wood used in making bows is generally ash, hickory, elm, iron-wood and cedar. No hickory grows west of the Mississippi River, and it is always hard to get it: and an Indian will always pay almost any price for a good piece of hickory wood.

When a bow is made of cedar, it need not be seasoned; but all other woods require seasoning, and are not worked until quite dry. Every Indian lodge has bow-wood hung up with the arrows in the smoke of the fire, but well out of reach of the flames.

A warior, with a sharp knife and a sandstone or file, can make a bow in three days, if he works hard, but it generally takes a week, and often a month to finish a fancy or fine bow. When done, such a bow is worth only about $3 in trade.

All bows differ in length and strength, being gauged for the arms of those who are to use them. A white man would, until he learned the sleight of it, find himself unable to bend even the weakest war-bow. This has often given rise to the belief that Indians are stronger than white men, which is a mistake, for the Indian is not the equal of the white man in either strength or cunning. I know this is not the general belief, but it is the fact, and I never saw an Indian yet who could outwit a white man when real cunning was required. So, too, I have seen a slight and small white man bend with ease the strongest bow when he had once acquired the art.

A white man, too, can send an arrow as far and as deep as an Indian.

I once had an officer named Belden with men who had lived twelve years with the Indians, and he could shoot an arrow into a buffalo while running so that the point would come out on the opposite side. He would also plunge an arrow into a beast so that it disappeared, and not even the notch remained visible.

The power of an Indian bow can be better understood when it is known that the most powerful revolver will not send a ball through a buffalo. Belden said he had seen a bow throw an arrow 500 yards, and I myself have seen one discharged entirely through a board an inch thick. A man's skull was found in the West transfixed to a tree by an arrow which had gone entirely through the bones, and fastened itself so deep in the wood as to sustain the weight of the head. The man most likely had been tied up to the tree, and then shot and his body left to rot away. It had all disappeared but the grinning skull on the arrow.

The Sioux and Cheyenne bows are made strong on the back by a a layer of sinew glued to the wood. This sinew, as well as the bow-string, is taken from the back of the buffalo. It starts from the hump and runs along the spinal column to the tail, and is about six feet in length.

The surface of the bow is made flat, and then roughened with a file or stone, the sinew being dipped in hot glue and laid on the wood. The sinew is then lapped at the ends, and on the middle or grasp of the bow. The string is attached while green, twisted, and left to dry on the bow. The whole outside of the wood and sinew is next covered with a thick solution of glue, and the bow is done.

Rough bows look like hickory limbs with the bark on, but some of them are beautifully painted and ornamented. A trader once glued some red velvet on a bow, and the Indians were so pleased they paid him an immense price for it, and never seemed to tire of looking at it.

The Crow Indians make bows of elk-horn. To do so, they take a large horn or prong, and saw slices of each side of it; these slices are then filed or rubbed down until the flat sides fit nicely together, when they are glued and wrapped at the ends.

Four slices make a bow, it being jointed in the middle. To make it secure another slice is laid on the bow at the grasp, where it is glued fast. The whole is then filed down until it is smooth and perfectly proportioned, when the white bow is ornamented, carved and painted.

Nothing can exceed the beauty of these bows, and it takes an Indian three months to make one. They are rare and expensive. and Indians do not sell them.

Mr. Belden had a very fine elk-horn bow, which he got for a friend, and which he had paid an Indian thirty-two dollars to make. The elk-horn bow is so stiff that it is almost impossible to bend it, but after some practice it can be bent with apparent ease, and made to send an arrow 400 yards.

In traveling the Indians carry the bow in a sheath attached to the arrow-quiver, and the whole is slung to the back by a belt of elk or buck skin, which passes across the breast diagonally, and is fastened to the ends of the quiver.

The quiver and bow-sheath are generally made of the skin of an ox or some wild animal, and is tanned with the hair on. The quiver is ornamented with tassels, fringe or buckskin, and the belt across the breast is painted or worked with beads.

Each Indian has his sign or name on his belt, bow, or sheath. The great chief, Spotted Tail, had his bow-sheath made from the skin of a spotted ox he had killed in a train his warriors captured: and. as the tail was left dangling at the end of the sheath, the Indians always called him Spotted Tail, or the Man with the Spotted Tail.

So Mr. Belden tells us, but in this I think he is mistaken, as I have often been told by the soldiers and old frontiersmen that, when Spotted Tail was a young man, he wore a coon's tail in his hair, and from this took the name. He was a very brave man, and our soldiers often saw his coon tail waving in the front of the fight, so that they, too. came to know him as the Man with the Spotted Tail.

Now you may wonder what this Indian's name was before he was called Spotted Tail, and I must tell you he never had any name but Spotted Tail. Indians do not name their children as white people do, but leave them to make a name for themselves. Some Indians have half a dozen names while others have none at all.

An article of clothing, an act of bravery, or some incident in his life generally fixes the name of an Indian, while some new deed or change of dress may change it. The famous Sioux chief, Red Cloud, when a young man, had all his warriors wear red blankets, and when advocating war said he would "launch his warriors on the whites like a red cloud," and was ever afterward known as Red Cloud.

To return from this digression to our subject. The bow, to shoot properly, must be held firmly in the three fingers of the right hand: the arrow is fixed on the bow-string with the thumb and forefinger of the left hand, and the other three fingers are used to pull the string.

The shaft of the arrow lies between the thumb and forefinger of the right hand, which rests over the grasp of the bow. Boys will note particularly how it is held: and, to shoot properly, the bow is turned silghtly so that one end is higher than the other, and then the arrow is launched.

Not only is the bow used as a weapon, but it serves as an implement with which to disgrace a man. Thus an Indian who is struck with a bow is as much disgraced and insulted as a white man who is cowhided by another. To strike one with a bow means, in the language of an Indian: "Go. coward," or "You are not worthy to be killed with arrows," or "I do not consider you a brave or honorable man," which is the worst of insults to a savage. An Indian struck by a bow and who does not resent it, is looked upon with contempt and never again treated with respect by his fellows.

PALEOLITHIC MAN IN KANSAS.

The stone age has been divided into three principal periods, the names of which are the Eolithic, or dawn of the stone age, and the Paleolithic, or ancient stone age, and the Neolithic, or recent stone age. Archæologists are not certain as to whether any remains of the Eolithic period have been discovered in America. In fact but little is known of this period in any other part of the world. A great many implements of the Paleolithic period, however, have been found in this country, and here in Kansas we have what is, without a doubt, the remains of Paleolithic man.

The Mound Builders are generally considered an ancient race, but still they have been assigned to the Neolithic period, or recent stone age. There have been found in Kansas the remains of a race which antedates the Mound Builders and compared with which the Mound Builders must be accounted modern. Geological study proves this conclusively, and shows that this strange race must have lived here about the time of the glacial period or possibly before. The wrought stone implements found in the gravels of California prove beyond a doubt that during, or before the glacial period, the Pacific coast was inhabited by man. Some of our greatest scientists have come to this conclusion. It is the writer's intention to present in this article a few brief points to show that at an equally remote period this region was occupied by man. The geological formation in Kansas is very simple and can be clearly defined. Prior to the drift period the beds of the Kansas streams were much deeper than at the present time. Subsequently the valleys were filled with a lacustrine or swampy deposit of considerable depth. Just beneath this last deposit have been found the remains of prehistoric man and if the Mound Builders belonged to the Neolithic period we would certainly assign these later remains to the Paleolithic period. As the late Judge West said: "Here we have a buried race enwrapped in a profound and startling mystery—a race whose appearance and exit in the world's drama precede stupendous geological changes marking our continent, and which perhaps required hundreds of thousands of years in their accomplishment. The prize is no less than determining when this mysterious people lived, how they lived, when they passed out of existence, and why they became extinct."

While parties were digging a well in the western part of the city of Lawrence, W. H. R. Lykins found a flint Paleolithical implement about thirty-five feet below the surface. The implement measured about two and a half by four and a half inches. The formation here was, two feet of soil, nearly thirty feet of clay formed by long ages of washing from the adjacent hills, a bed of sand and gravel about four feet deep, and twenty feet of blue shale resting upon carboniferous limestone. The implement was found in the bed of gravel. From this same bed near Silver Lake, in Shawnee county, the remains of a mastodon were taken. This goes to show that man was contemporary with this extinct monster in Kansas. On Rock Creek in Pottawatomie county, charred human remains and wrought stone implements were found thirty feet below the surface. A human skull was found on Chapman creek at a depth of twenty-three feet. At Ellsworth, in Ellsworth county, a portion of a human jaw was found twenty feet below the surface. On a stream in Lincoln county implements and other remains were found at a depth of thirty-one feet.

The writer found one of these rude flint implements at a depth of about twenty feet in a railroad cut near Potter, in Atchison county. They have been found all over the state, and the conditions under which they are found proves conlusively that man occupied this region previous to the deposition of the soil which covered these antique objects, and the process of this deposition probably occupied thousands of years.—Geo. J. Remsberg, in Missouri Valley Farmer.

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EDITORIAL.

What Shall It Be?

The citizens of Tacoma in the far away state of Washington are dissatisfied with the name given to the famous mountain peak, an extinct, volcanic, snow topped cone within sight of that city.

In an interesting historical pamphlet written by one of Washington's foremost citizens entitled: "Is it 'Mt. Tacoma' or 'Ranier'?" the Hon. James Wickersham, a member of the Tacoma Academy of Science, brings forward strong evidence why it should not be called Mt. Rainer.

The English voyager Van Couver was not the first white man to see this prominent mount as the writer shows: nor did he come nearer to it than one hundred miles. Two years before the arrival of the Englishman the Spaniards explored the exact spot from where he named the peak after Ranier, a friend in distant England. It is not known for a certainty whether a name was given it by the Spanish voyagers.

The member of the Tacoma Academy insist that it be called by its rightful name, which is "Tacoma", and Judge Wickersham brings forward many Indian witnesses as well as whites to prove that the aborigines called it "Tacoma", which in English means "the white snow covered mountain," long before Ranier was born, and persists that this name forever remain so.

It should be the desire of all American people to preserve momentoes of our Aboriginal and mysterious race which is fast disappearing. This can be done only in protecting not alone from destruction their works left behind, but also jealously guarding the names they gave to our mountains, lakes, streams, etc.

Why should not then this prominent snow clad peak have an Indian name forever perpetuated as Mt. Tacoma.

We hope our Government will favor the desires of Tacoma's citizens, and when ready officially announce that it shall be given its aboriginal name.

A. F. Berlin.

CORRESPONDENCE.

Ed. Archæologist:

I think that all students of American antiquities should gladly receive The Archæologist. It has brought before the public several excellent articles, it has set itself against fraud and deception. I am pleased that the editor has cautioned readers against Doughty's pamphlet in such an able manner. There is entirely too much trash published under the name of prehistoric archæology. Perhaps none of the older sciences, in their younger days, were beset by such a motley crowd of "camp followers."

The science has hardly been given that dignity and importance to which it is entitled. Fools have rushed into print and have served up a most horrible meal for their readers. Persons who saw a few village sites or tumuli, travelers among tribes, adventurers, etc., have felt called upon to give to the world the result of their observations. As a natural consequence a beginner in the study is perplexed and nonplussed. But now there comes the dawn of a new era. Harvard, Yale, the Universities of Pennsylvania, Chicago, and other institutions have taken up the study of Anthropology as a science. The student need no longer plod along under the old regime. He can attend the lectures of Professors Putnam, Starr, Abbott, Brinton, Wilson, etc. He can have field, library, and museum work. He can arrive at some definite understanding of the American race, its customs, habits, religions, etc. At first a mere collector, he may develop into a worthy student and further his own interests by building up a good cause.

But how few there are who avail themselves of these magnificent advantages. I venture to assert that there are not many readers of this magazine who carefully read the Smithsonian or Bureau of Ethnology reports. Yet in them all the labors of the most prominent Anthropologists of the day are set forth. The recent discussion pro and con of the existence of a glacial man in itself will post a student upon the discoveries in the gravels. In the "battle of the giants" beginners can pick up many valuable suggestions. Go to any public library, look through the following publications of the past year: Popular Science Monthly, Science, American Anthropologist, Man and the Glacial Period: and in them you have both sides.

Department M of the World's Columbian Exposition will have the best exhibit illustrating pre-Columbian life, ever seen in the world. Every reader of THE ARCHÆOLOGIST ought to spend at least a week studying it. A whole building will be filled with objects of every character which are familiar to the daily life of savages. Tribes from oceanic isles, Australia, Asia, Africa, Europe and South America are to be represented by inhabited villages.

To return to Mr. Berlin's review I am glad he wrote it and I trust it will not be hastily read. Throw away trash and study. Read good books. I will send a list to any one who is interested. I will be glad to suggest courses in the University of Chicago to those who desire to enter upon serious anthropologic work.

WARREN K. MOOREHEAD.
5215 Washington ave.
HYDE PARK, CHICAGO.

* * *

ED. ARCHÆOLOGIST:

In becoming a subscriber and reader of THE ARCHÆOLOGIST I wish to express the hope that it may become a permanent and satisfactory success. A convenient periodical of this character, cheap in price, is certainly filling a long felt want: and all students of American archæology should be urged to make it the common medium of their interchange of views and opinions, as well as the repository of facts and new discoveries in the field of study and observations.

Reports of investigations, and other valuable papers, by our archæologists and ethnologists, are scattered through many different publications that are inaccessible to the large majority of us, who cannot afford the means for subscribing to all of them, and many are consequently lost to us. With this magazine established as the recognized representative and organ of American archæologists, and that class of students induced to send their contributions to it, all would be benefitted, and the progress of this noble science greatly accelerated.

Could this be brought about the scope of this periodical could in time be extended so as to comprise all the departments of American anthropology: and should now by all means include researches in post-Columbian as well as pre-Columbian ethnology.

With the view of securing this comprehensive medium of co-education in this direction, when at the National museum last June, I submitted to my friend, Prof. Otis T. Mason, of that institution, the suggestion of publication by the government, under the auspices of the Smithsonian Institution, of a monthly or quarterly Anthropological Bulletin, which met that eminent scientist's cordial approval, and he laid the plan before the higher authorities. I have been informed that my suggestion will receive due consideration after the termination of the World's Fair. In the meantime if the earnest cooperation of the Anthropologists, Ethnologists, and Archæologists of our country can be secured, we can place your periodical on a basis that will obviate the need of a Smithsonian Bulletin, and be equally in easy reach of all. J. F. Snyder, M. D.

Virginia, Cass Co., Ill.

Ed. Archæologist:

Talbot county, Maryland, one will find particularly rich in Indian relics, of all kinds, which affords a fine field for collectors. In my collection I have arrow and spear-points, mortars, pestles, celts, axes, dressers, discoidal stones, and perfect specimens of many other implements.

I also have pieces of several curious worked stones, which I am unable to classify. Not long ago was found in the adjoining field to my house what was probably used for a tally stone. It is quite thin and about three inches in length. The top of the stone being about one-half an inch wide and two inches at the bottom. It is notched with fourteen notches on either side, and seven notches across the bottom. There is a perforation at the top, and were it not for the notches, it might very readily be mistaken for an ornament: but as some of them are checked off it can easily be seen that it is undoubtedly a tally stone. Only a few miles from here were lately dug up several Indian skeletons, and as usual the graves were rich in Indian implements. Mrs. G. F. Dunham.

Tunis Mills, Md.

Ed. Archæologist:

While looking for Indian relics along the shore of Seneca river in Cayuga county, on a gravelly bluff jutting into a marsh, the site of an ancient village, I picked up an object made of granite, a perfect ellipse, bounded midway in its shortest circumference by a well defined groove an inch in width. This relic measures 21 inches in its longest circumference and 16 inches in its shortest, and weighs about 18 lbs. It has been suggested to me by some who have seen it, that it is a net sinker, while others say it was used as a maul. Can any of your readers enlighten me on this subject?

In the same vicinity, was found a very fine spear-head about five inches in length, of a beautiful golden color. As it is a stone entirely foreign to this part of the country, I would like to enquire what material this spear-head was made of. Geo. H. Macomber.

Auburn, N. Y.

The large grooved implement mentioned above by our correspondent was perhaps an anchor for a canoe or dugout. It may have served in holding in place a large net. Its close proximity to the march, which in prehistoric times may have been a lake or part of a body of water suggests this. If the object was ever used as a maul or hammer, as we are told some wish it to be, evidences of battering must be visible at each or one of the ends.

The spear-head of a golden color found in the same vicinity must have been made from jasper. This material is found in great quantities at the great jasper quarries of Macungie and Vera Cruz, eastern Penna. Here are evidences that the aborigines worked these quarries hundreds of years. Ed.

NOTES.

Early Methods of Boring.

In the progress of recent investigations at the National Museum into early methods of boring as practiced by different races, the writer thought that the similarity existing between the Esquimaux toggle or two-handed strap-drill, and practically the same implement used by the ancient Greeks and Hindus, and also the resemblance between the bow-drill used by the early Egyptians and the same tool used by American Indians could not fail to interest those concerned in early methods of boring.

There is an Egyptian fresco in the Royal Museum of Berlin, representing a workman with a bow-drill boring a hole in the bottom of a chair. and the only difference between the drill he is using and those in the National Museum collection, especially from the Eskimoan area, is that the Egyptian bow appears much longer than the same tool used by our Indians.

There is much in a comparison of these drills that is of interest regarding the evolution of the implement and the possibility of independent invention. The toggle or two-handed drill consists of a shaft a foot or more in length. a head-piece or bearing of wood or ivory. with often a stone socket for the drill shaft to revolve in at the top. This socket-piece is held by the one working it between his teeth, and thus kept in position. The shaft is revolved by means of a narrow strap of leather wrapped once around it. On the ends of the thong are tied pieces of wood or bone by which the operator pulls the strap alternately to the right and to the left, thereby revolving the drill, which by downward pressure on the socket-piece is prevented from slipping aside.

In the ninth book of the Odessey, Ulysses describes how he and his companions, imprisoned in a cave, bored out the eye of Polyphemus (Cowper's translation.)

"They grasping the sharp stake of olive wood,
Infixed it in his eye, myself advanced
To a superior stand, twirled it about.
As a shipwright with his wimble bores
Tough oaken timber, placed on either side
Below, his fellow artists strain the thong
Alternate, and the restless iron spins,
So, grasping hard the fire-pointed stake,
We twirl'd it in his eye; the bubbling blood
Boil'd round about the brand."

The bow-drill used by the Zuni and other American tribes is an immense improvement on the above. for the thong is attached to a bow worked with the right hand. and the head-piece is held by the left. thus saving the jar to the head and teeth. which with the toggle drill was considerable. —Science.

* * *

There were recently brought from Honduras for the Peabody Museum at Cambridge, Mass,. a number of very interesting objects, of which in his report of the museum to the president of Harvard University, p. 7, Prof. F. W. Putnam says: "There were received a large number of most interesting and important objects illustrating the wonderful carvings in stone, etc. In the lot are several incisor teeth, each of which contains a small piece of green-stone, presumably jadeite, set in a cavity drilled on the front surface of the tooth. We had before received from very ancient graves in Yucatan human teeth filed in a peculiar manner, and now we have teeth from the ancient graves in Copan ornamented in another way. This is of peculiar interest in adding one more to the several facts pointing to Asiatic arts and customs as the origin of those of the early peoples of Central America. A most striking resemblance to Asiatic art is noticed in several of the heads carved in stone,—one in particular, if seen in any collection and not labeled as to its origin, would probably pass almost unchallenged as from southern Asia. These may prove to be simply coincidences of expression of peoples of corresponding mental development brought about by corresponding natural surroundings and conditions. At present we must admit that there are many resemblences in architecture, sculpture, ornament, and religious symbolism, between Central America and portions of Asia.

* * *

One of the largest flint implements in the United States was found on the farm of James Hertzell in Shawnee county. The flint measures 21¼ inches in length, 7¼ inches in width and ¾ inches thick. The implement may be seen in the State Historical Society collection at Topeka.

Col. J. B. Stockton, of Toronto, Kan., reports a remarkable prehistoric cave in Woodson Co. about two miles north of Toronto. There are many curious carvings on the walls of this cave, some of which are different from anything of the kind heretofore found. The cave, when discovered, was almost filled up with debris, and the walls were covered with heavy thick moss, the growth of centuries. Col. Stockton is inclined to believe that this cave was occupied by a race which antedates the Mound builders and Aztecs. It is said to be one of the most interesting antiquities in Kansas.—From The Missouri Valley Farmer, Feb. 22, 1893.

* * *

Mounds in Cowley County, Kansas.

Mounds are numerous in Cowley county. The most important of these is located on a hill on the Wright farm just north of Arkansas City. This mound is probably the largest yet discovered in the state. It is about 200 feet in diameter at the base and about 25 feet in height. It is quite conical in shape. At each cardinal point on the sides of the mound is a stone slab, each slab being of a different color. No attempt to open it has been made except by two students, who undertook to tunnel through it from side to side. After working half a day and finding the earth fairly baked, they abandoned the work. One of these students relates that when a small boy he took occasion to visit the mound quite often for the purpose of throwing the peculiar stones that were found on its summit, as these stones were just the right size to throw. Unfortunately, however, all these have fallen prey to the school boy's sport. The young man who related the above is very honest and his word is not to be questioned. A great many shell beads and large quantities of ore blossom have been found on the mound, the latter having probably been carried there from the mountains.

Dr. James Young, an archæologist of Ohio, while visiting in Arkansas City several years ago, observed a number of mounds along the Arkansas and Walnut rivers. There are also several south of town on the opposite side of river, and still more just east of town on Grouse creek. None of these mounds have ever been disturbed, except two on Walnut river, which were opened by Mr. Reinsch. They contained nothing but pottery fragments, flint chips, charcoal, bones and arrow points. These mounds were originally about 35 feet in diameter and 4 feet in height. Mr. Reinsch found a hollowed mortar or grinding stone, made of white limestone, in the vicinity of these mounds.

Just south of Maple City there are some mounds which, from all appearances, were opened many years ago and their contents taken, except once in a while an arrow point is found in the dirt that was thrown out. Large trees are now growing on this dirt. It is believed that the mounds were opened by the early Jesuits or the followers. —Geo. J. Remsberg in "The Missouri Valley Farmer," Feb. 22, 93.

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TO THE MEMBERS OF THE AMERICAN ARCHÆOLOICAL ASSOCIATION.

The time is approaching when we must choose officers to serve for two years, beginning the first of September next.

In order that all may have a voice in this matter, every member is requested to make nominations.

The offices to be filled are President, Vice-President, Secretary, Treasurer, and Librarian. These officers must be chosen from different states, and each one must be at least 21 years of age.

This is not an election, only a nomination of candidates. The election will be held in the near future. How soon, depends on with what promptness the nominations are sent in. Send them in at once.

Another question of great importance is, "Where shall we hold a convention this year?" A convention certainly must be held this year if we wish to make the association a success. So when you send in your nominations for officers, also mention the city at which you would rather have the convention held. Attend to this at once.

JOSEPH WIGGLESWORTH,
Wilmington, Del.

◆

Owing to the suspension of our previous official organ, the cotinued illness of our secretary, and the dereliction of our treasurer, the affairs of the A. A. A. have gotten into a snarl which will require some time to untangle, but we are pleased to note that there is now a disposition among the officers and members to again put the association into good working trim, and we hope that this will be speedily accomplished. A copy of this issue will be mailed to all members. Those desiring to continue as such will please notify us at once, as all who are not heard from by May 10, will be dropped from our list. Suggestions for the good of the association will be thankfully received and published when desired.

A. C. GRUHLKE.

◆

Next month we hope to be able to publish a full report from the secretary of the A. A. A.

EXCHANGE DEPARTMENT.

Exchange notices pertaining to archæology, not exceeding 35 words, will be inserted free for all regular subscribers.

Want and for sale notices from collectors, of 35 words or less, will be inserted in this department for 15 cents per month. Dealers are referred to our regular advertising rates. Address all communications for this department to A. C. Gruhlke, Waterloo, Ind.

To exchange for minerals, Indian relics or shells, Vol. 1 and 2 of Enclycopeadia Brittanica, Beeton's Dictionary of Natural History, 400 Ills. Make me an offer. Fine specimens of gypsum for other minerals or relics. Chas. Miller, jr., 212 Jefferson St., Grand Rapids, Mich.

MOUND and Aztec pottery, axes, celts, pestles, etc., to exchange for pipes or amulets, or will pay cash. Lock Box 41, Waterloo, Ind.

WANTED, two fine and perfect drills in exchange for fine Tenn. arrowheads. Also want six arrowheads from Neb., and six from Minn., in exchange for Tenn. arrow-heads. G. W. Racey, East Cumberland Gap, Tenn.

WILL exchange Columbian stamps for nice small flint arrow-points. J. A. Metcalf, Oxford, N. Y.

TWO H. P. engine and boiler, complete, with governor, pump, gauges, etc., in fine condition, worth $60: will exchange for a good colleetion of Indian relics or old U. S. coins. C. E. Tribbett, Thorntown, Ind.

CLIMBERS and straps to exchange for shells or Indian relics. Glen B. Wynn, Kedron, Ga.

FOR SALE:—A small duplicate number of the rare and beautiful Oregon arrow-points. Every point well authenticated. Price, 50 and 75 cents a piece. A. F. Berlin, Allentown, Pa.

WANTED:—Nos. 1 and 2 of Vol. I, 4 of Vol. II, 2 of Vol. IX, and title page and table contents of Vols. I and II of American Antiquarian. State price. J. P. MacLean, Morrison, Ill.

The Archæologist.

VOL. I. WATERLOO, INDIANA, MAY, 1893. NO. 5.

ARE THERE RELICS OF MAN IN THE TRENTON GRAVELS?

[BY DR. C. C. ABBOTT.]

There has recently appeared in a Chicago periodical, an article entitled "Are there traces of Man in the Trenton Gravels". As it was written in the interest of self and not science, it is not worthy of a serious reply, or review; and yet as there may be some who read it, not thoroughly conversant with the recent controversy concerning the question of the antiquity of man in North America, a few words may not be out of place—a few words of warning merely. In the first place, archæological(?) articles written to order are not usually of much value, and this one in particular, is not only valueless, but culpably inaccurate.

The cover of the "extras" is illuminated by an illustration, which appears also in the body of the text, with the statement that on the present face of the river bluff are "many implements", and the other copy of the picture says "many turtle-backs". Now, the author of the article has insisted that "turtle-backs" are not implements; so the reader can take his choice; but whether implements or "turtle-backs", the statement is not true.

Again, in a section of the bluff, back a few feet from the river, there is designated a strip of which it is stated, "no implements"; this is equally false. If the author had merely stated he could find no implements, and drew his conclusions from that fact, well enough; but to assert boldly, that no one else ever found any such, is to call by an ugly name, a goodly company of trained observers; and it may here be added, that the author of the Chicago periodical article cannot claim to be called an expert, unless expertness is greatest at the outset, and discriminating power wanes as one grows older. Others have watched the excavations with equal care, and while they did not pull from the sides of the digging, unquestionable implements, they did gather them from the top of the long ridge of earth thrown out on the street; and such top dirt came from the bottom of the trench.

The author too, ignores the fact that still farther back from the river, where cellars are being dug, a good many such objects (palæoliths) have been found, and not far away from the street digging, in the cemetery, such objects occur, when graves are dug. All this goes for nothing, and for a very obvious reason. He determined at the outset not to find an implement in place. The cant and twaddle that occasionally crops out in the pages of the article, and of other articles, is pure hypocrisy.

Now, suppose all the palæoliths or turtle-backs were found on the face of the bluff—which is very far from true—and so rolled down from the surface soil, how is it that all sorts of more modern (Indian) implements, have not done the same thing? How is it, that there has been such discrimination? Again, the author insists that these "turtle-backs" are "rejects" left by the Indians, because they would not make implements. Well, where are the chips and hammers? Every "turtle-back" means a dozen to twenty chips, and these ought to be with the specimen, but they are not. I have studied these gravels for twenty years, and know whereof I speak. Again, the present river bank is not the one of Indian times, for in the past two centuries it has been going inland steadily, as old deeds and surveys show. Never a stone-age Indian saw a foot of the present river shore on the Jersey side, between Trenton and Bordentown. Lastly, the oft-repeated statement that these "rejects" are only found along the river. They occur sparingly, but in significant numbers all over the area eastward and southward to the Atlantic ocean, and many are as clearly defined, with secondary chippings, as any European palæolithic implement.

When the author of this remarkable screed can successfully convict a half score of prominent geologists and archæologists of false statement, then he is entitled to a hearing, but not before. As it is, the article stands as an example of impudent assumption without a parallel.

A LIST OF SOME STANDARD ARCHÆOLOGICAL LITERATURE.

A request, from the editor of "The Archæologist," for a list of some of the literature that "should be read," by readers of that paper has been received. In reply I wish to remark that it is not my purpose to state "what should or should not be read", as he desired. Such a decision must be made by each reader for himself, and for the writer to pretend to make such a distinction would be an unpardonable assumption.

However, acting upon the suggestion, a list has been hastily prepared, including a few of the many books and periodicals which students of anthropology find useful, and, which have been perused by many a noted archæologist. Much of this literature may be found in any public library.

If any of the readers find the list of use, and after investigating the publications mentioned, find that they are such as "should be read" by them, and with which they were not already acquainted, the object of this communication will be fulfilled.

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CHICAGO, April 2, 1893. HARLAN I. SMITH.

WAMPUM.

[BY WM. W. ADAMS.]

For the earliest account of Wampum we have to depend on Indian legends. According to one story when Hiawatha was on his journey to the land of the Mohawk Indians he passed a lake whose shores were covered with white shells. These he gathered and strung, and carried with him as an emblem of peace.

There are other legends that tell how Wampum began, but one might as well tell how the Indian originated. I think that wherever lived an aborigine there was to be found Wampum of some kind. I have not had an opportunity to explore much, except among the graves of the Iroquois Indians. It is certainly quite common here. I have found it in the stone graves in Tennesssee, but in quite limited quantity.

In the first treaties of the Whites with the Indians they had wampum belts to which they talked. As it was doubtless an old custon to have these belts to remember certain transactions of their councils or treaties, as we are well aware they were ignorant of the method of writing. Two kinds of these belts were in use. The oldest were made from Olivella shells by taking off a small portion of the larger end when they could be easily strung. The writer found one belt containing over 5,000 of these shells sewed on buckskin in diagonal rows. These were used principally by chiefs. The one found was doubtless used when the League was formed, and as the wampum keeper happened to die with it in his possession it was put in the grave with him.

The other wampum was worked out of the common clam shell. From the purple point was made the most valuable variety. The whole shell was however used, which caused a great proportion of white. The pieces as made by the Indians were of quite unequal length from one quarter to one half inch in length, and about one eighth inch in diameter, generally not well rounded while the hole was tapering being bored from both ends. With their method of work they must have had a laborious time even in making a small belt.

When the Whites came they soon saw how highly the Indians prized this kind of money, and it was not long before machinery was called to their assistance to manufacture it.

At one time it was quite an industry among the inhabitants of New Amsterdam, where it was made by the barrel. Most of this found a market among the eastern tribes, and also came into the hands of the Iroquois Indians.

Although the writer never heard of much being found in the eastern states, yet we read that King Philip had a mantle or cloak covered with wampum, but we hear nothing more about it after his death. One writer asks where are all these belts of wampum? Most of them have been buried. The writer has found five or six containing from 1,000 to 5,000 beads. There are a few among the different tribes, and a very few in collections. When they are taken from the ground there are but few that retain their original color. They have lost their lustre, have the appearance of chalk, and they are often so far decayed that one finds great trouble in saving them. If found in light or sandy soils they are often quite well preserved. One not having seen wampum when new can form an idea of its beauty. Sometimes we find a piece that has retained its lustre so that a little rubbing will restore its original color, which is very pretty. I would like to hear from some of my brother collectors in reference to this article of aboriginal money and ornament.

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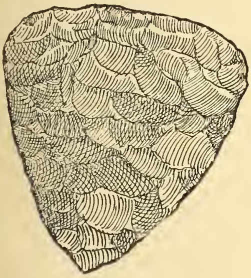
AN INTERESTING DISCOVERY.

[BY GEO. J. REMSBURG.]

An interesting archæological discovery was recently made at Oak Mills, a small village on the river about 10 miles below Atchinson, Kan. Two colored men were repairing the fence around John Davitz's lot when to their mutual surprise they observed a very beautiful arrowpoint which the heavy rains had washed from a ridge of clay along which the fence extended. This led to further examination, and on looking around they noticed several large flint implements projecting from the earth near the top of the ridge. Flushed with a desire to descry the meaning of this they commenced excavating, when to their utter astonishment they made a remarkable disclosure. It was found to be an aboriginal place of interment. They exhumed the remains of several Indians, the bones being badly decayed. Not even a small fragment of bone could be saved, except a few teeth which are now in possession of the writer.



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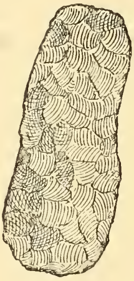

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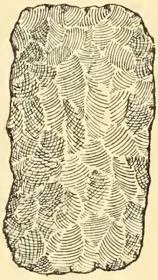

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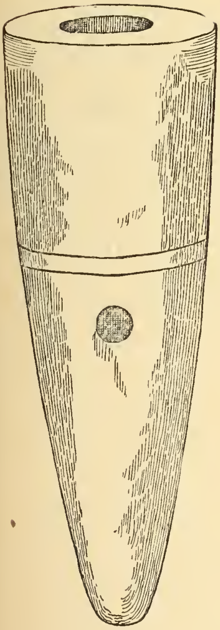

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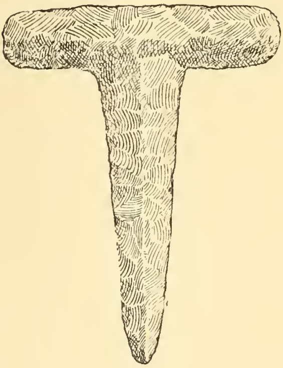

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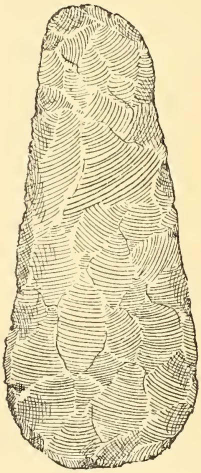

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The teeth were worn down very short and smooth, which would probably indicate that the deceased were of an advanced age or that they had subsisted on a diet of dry corn. The skulls were completely decayed, but the imprint of one of them indicated that it was of unusually large proportions. As near as could be ascertained the deceased had been placed on the back with the head to the west.

The most interesting feature of the exploration was the finding of numerous flint implements of various kinds. There must have been about fifty fine specimens. It seems that there was a pile of these implements at each shoulder of the deceased, and a pile on the breast of each one. They consisted of arrow and spear heads, scrapers, drills, and a number of large implements, concerning the use of which I am not able to advance a definite theory. I think it probable that they served for cutting purposes and not for spearheads as some have conjectured. They could hardly have been used for spearheads, their shape being ill-adapted for that purpose; nor do I think they were intended for scrapers, as they are dissimilar to any scrapers heretofore found. Some, which are more short and blunt, may have been used for heads to war-clubs. The large implements measure from four to eight inches in length, and some of them are four inches in width at the widest part They are mostly made of common blue chert. Figs. 1, 2, 3, and 4 show the shape of some of them. The drills are made of beautiful material of various colors, and are the finest specimens ever found in this locality (Fig. 5.) The arrow and spearheads and scrapers are also made of fine material not found here, and some of them are very perfect in finish. A streak of something resembling rust was observed in one of the graves; hence we have the inference that some weapon of iron was originally deposited with the remains. This however, had yielded to the gnawing tooth of time and was entirely consumed by rust. Everything goes to show that they are the remains of Indians who occupied this region centuries ago. The surface at this place did not present any indications of a burying ground and had it not been for the influence of mother nature with her washing rains, the discovery would not have been made. R. M. King, an old settler of this section, says he felled trees on this very spot more than twenty-two years ago, but did not dream that he was laboring over the ashes of a vanished race.

A great many relics have been picked up in the fields near this place, and the ridge on which the burying ground is situated shows evidence of having been a workshop also. A stone pipe was found in the field of R. M. King near by. Fig. 6 shows the natural shape and size of the pipe.

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SEPULCHRAL MOUNDS IN CALIFORNIA.

[Twentieth Century, March 9, 1893. Vol. X, No. 10, P. 14]

In the Santa Maria and Cuiama Valleys of the Coast mountains in California were lately discovered a number of ancient sepulchral mounds, which, on being dug into, yielded a quantity of copper and stone weapons, implements, etc. The existence of these mounds was long known, but Juan Olivas, of Santa Maria, was the first to expose them. Toward the close of last year he dug ten feet into a grave. The first thing his pick struck was a polished slab. It was of slightly greater length than the ordinary coffin of an adult of the present age. When he gazed underneath he looked into a long box of stone which had nothing in it but dust. The body had lain so long that even the bones had disappeared, and there was nothing but ashes. The slab was of a peculiar hard and polished stone, the like of which there was none in all the country. It was very thin, however, having been worked down until it was not more than half an inch thick. Olivos worked away and got out other stones. The top, bottom, sides and ends were all of the same curious thin stone, and had been set in the earth and held by the soil without fastenings. We explored further and found numerous battle axes and other weapons of copper, and vessels peculiarly made of stone. Curious copper disks resembling coins were also found. There were many in the graves, and as the investigator pushed his way still further into the mound he found many other copper implements, axes and rude knives; some quite long and looking as though they had been used as spears. Mounds are scattered along for a couple of miles. There are probably 100 of them. Knowing there were similar mounds in Cuiama Valley, adjoining, he pushed on to them, and digging in found coffins, dust and implements of stone and copper, similar to those of Santa Maria. Everywhere were the marks of an ancient race, it is believed far antidating any hitherto known on the coast. High above the stage road between Los Olivos and Santa Barbara, near the graves, are some natural monoliths with smooth surfaces, on which are carved many strange characters, looking much like the characters used by the Egyptians on the tombs.

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REMAINS OF ANCIENT PEOPLE ON THE LOWER NEOSHO RIVER, KANSAS.

In 1530 perhaps, two Spaniards and a negro passed south of Vinita on their way to New Mexico. from the gulf. They called the people on the Neosho "Corn People," and those further west, among the buffalo, "Cow People." DeSoto may have reached this country in 1541 or '42, and he also found the country full of people.

In 1796 to 1812 Clermont settled near Coffeyville, and White Hair at Oswego. The people of the great Cherokee nation have lived in Georgia and west to Arkansas ages unwritten. The Osage, a Sioux, and the Cherokee have often met in battle, about the possession of Kansas and Oklahoma—a part or all. There are yet evidences of a great many villages and town sites, in the southwest, of an earlier people than the Cherokees and Osages. I desire to leave on record and speak of some landmarks of ancient people I know of in the southwest.

All the old town sites have been occupied by different races, one after another as the years rolled by, for ages. Beginning five feet in the ground we findshell beds of eaten mussels and rude, clumsy arrows, etc., then larger ones, and then some smaller and more artistic.

Only at three villages did I get metalic implements, seemingly those of the Osages—a bridle bit, a horse shoe, some copper pieces, and a smooth meteoric iron stone or an ore stone, spheroid and highly polished by human art.

Ancient people nearly always choose a town site on or near a stream at a ford where they could cross and make defense in case of sudden attack by an enemy. They were partial to springs of water, but often used swamp or creek water to drink. They also located near groves or hills where the cold northwest winds could not reach them and where their camp fires could not be seen at night, nor their wigwams by day, by a passing enemy. Some towns seemed to be too strong to regard this precaution. Malaria and swamp miasma they did not fear, and nearly always lived among swamps or on low, unhealthy locations and drank pond or creek water in the summer.

Their paludal dwellings may have been made on account of getting such food as fish, frogs, water birds, mussels and turtles, in such places and also roots and seeds growing there in their season.

Fish-spears and lances found at such places verify this.

Temporary habitations seemed to have been made by one or a few families near fields at crop times. All these old fields afterwards came up in briars. The "rubus canadensis," perhaps, and were the richest bottoms lands.

Habitations were nearly always chosen above overflow lands. They never lived on a high upland or open plain, but sharp ridges overlooking the river or bottom with parallel ravine back, looking like a natural fort they often occupied and left their flints and corn mills at such places to tell of it.

Burial of the dead took place certainly latterly on high, rocky bluffs, away from their habitations. The rocks were piled over the dead, making cairns and sometimes crevices in rock cliffs were used, and rocks piled above the dead, filling the crevices. I saw one mound of dirt near Red Bud school house. They seemed to shun the graves of their dead. Rock cairns built over the dead were afterwards filled with leaves and sticks by wood rats, and when the prairies on which the cairns were located burned in the fall, the tomb burned and the corpse cremated.

There are some places I know of near Oswego, I believe, where property was buried, such as arrows, etc., and even food, to remain until the owner made a journey and returned. These were called "caches."

The means of defense used by the ancient people were, impassable swamps, streams, and forts, on steep ridges, difficult to approach. One of these ridge-forts is on the Swanswick farm and one on the Dairy farm, east of Oswego.

I sent a rude soap-stone pipe of the ancient people, found near Oswego, to the Centennial in 1876. Later two pipestone pipes were found near here, and later still a sandstone one, elaborately worked, was found near the Diamond school house, They indicated the use and cultivation of tobacco. The corn mills or mortars found were always sandstone and so were the pestles used. Sometimes an Archæan drift stone, brought from the north, was used by them for a pestle. Sometimes the flints or hornstone, to make lances, arrows and scrapers were made of Drift—material found here, and again stones from abroad were used.

The mortars or mills had circular cavities in them ten to fourteen inches in diameter, and again some of them had disk-like cavities worked around the large one as deep and large as half of a hen egg—said to set the lower end of spinning spindles.

Their tools were flints chipped to an edge, never ground, and re-chipped to sharpen, sometimes till quite blunt.

There are to be always found at all their villages the chippings from flints left from implement-making and all the chip matrix at times.

Their tools of flint, and weapons for war and hunting, always of the same chert, found here, were hoes, axes, arrows, fish-spears, awls, scrapers, war clubs, and many implements we can find no use for. There were also spades, wedges, hatchets, and leaf implements.

Sometimes spindle holes were found in large sand rocks near the villages. One place I found human foot prints cut in the sand rock near Tulsa.

The mussel was a favorite food for the early people. They were the same kind as live in the river now. The unio undulatus they seemed to have eaten most. Some other mussels, as the unio solidus and u. securis were also found in the shell beds at the villages. The shell beds suggest feasts. I found the jaw of an antelope and perhaps that of a dog, when digging in these beds. Strange no buffalo bones are to be found in these beds, nor fish bones. The shells begin commonly eighteen inches in the earth; one place perhaps five feet. A village site on a mound where the wash was away from it the shells began eighteen inches down below surface. Strange these ancient people nearly always chose Champlain soil to build villages on. Were the people here in that epoch and was it and Noah's flood the same? There were more people east of here in Missouri in ancient times than here. On Shoal creek near Redding's mill, 40 miles east, are strange burial mounds, built in rows. Labette county, I think, once had 2,000 of these people, including all the Neosho timber.

On James Parnell's farm on the Labette creek was once a large town. It was on the creek, had spring, timber, mussel beds, fields, graves and ponds for food. Across the creek a mile below was a small town, with timber, a ford on creek and pond water to drink. Both of these sites were unhealthy. Logan's ford on the Labette was another town. This had timber, shell beds and creek water to drink and corn fields. A cellar dug here found a rude sandstone floor eighteen inches below the surface and shell beds as deep. At George Craig's near the mouth of the Labette river, was another large settlement and town. Here they made pottery, drank pond water, had woods and swamps for defense and was a very healthy location. The people here got food from the paludal waters no doubt. Near the Diamond school house, three miles southeast of Oswego, was a town with smaller settlements and corn fields many places around. The ponds and swamps near by made this place unhealthy, but gave food, defense and water to the people. White Hair's town east of Oswego under the hill, was no doubt occupied by many races before his time. This was sickly, had swamps, shelter from the northwest winds, timber and a ridge fort for defense. This town never cared for health or feared an enemy, and nothing for the fine spring and healthy location above them, was on Champlain deposit and had graves for the dead on the hills above them.

East of the Oswego fair grounds under the hill and one-half mile north, was another town site on which many succeeding races dwelt. There were Champlain soil, spring water, timber and bluff to brake off the cold northwest winds. There were also cultivated fields, swamps, and a sickly location and a ford on the river near by. The mussel beds here are prominent. By the shell beds we know the people occupied the towns when shells were obtainable in the summer in sickly seasons. On the Lake farm and Swanwick's adjoining it on the north was a town the largest of any yet found. Here are two fine springs of water and a ridge fort for defense. This is on Champlain deposit, has a ford on the river, one or more fields on both sides shell beds, graves and a healthy site. A village on overflow land across the river from this one, we found there were timber and ponds near it, but across the river we found corn mills, spindle stones, fish spears and flint hoes here.

Across the river at Red Bud school house six miles north of Oswego, was an old town near a spring. It was on Champlain soil, had shell beds, timber and the river near. Near the Horner mound are evidences of early people, and one mile north of Chetopa is a fine spring, and we did look for early human occupation of the dry and high location for a town near it, but there was none; but under the bluff along the sickly creek to the east, where savages could skulk and hide, evidences of early people are found. What made these early human beings cling to ponds and swamps?

On Shoal creek two miles above its mouth is an old town on a high, somewhat healthy location, there are fine springs there and a ford over the creek. No swamps are near, no tombs are visible and it is on Champlain soil.

W. S. Newlon

PREHISTORIC FORT IN ATCHISON, KANSAS.

It is not generally known, even to the citizens of Atchison, that almost in the centre of this city, within three or four blocks of Commercial street, there once existed an immense excavation or fortress, one of the most remarkable on the continent.

South of White Clay creek, between White Clay and the branch running into it from the southwest, beginning at Eleventh St., is a high bluff or ridge. This ridge gradually ascends towards the west for a distance of about 200 yds. terminating in a beautiful round crest. From the summit of this crest may be obtained a view of the surrounding country for miles in almost every direction. It is one of the most commanding positions to be found on the Missouri river.

The upper portion of this ridge consists of a strata of clay and gravel, four or five feet thick at the lower end, resting upon a bed of limestone, 15 feet in thickness.

When Atchison was settled this extended several hundred feet farther east than it does today, the eastern portion of it having been removed—the earth for filling and the stone for building purposes,

The land on which this fortress was located was purchased in 1857 by Mr. Trimmer, for many years a well known contractor and builder of this city, who still owns it.

At an early day quarries were opened on the side of this ridge by Mr. Trimmer and others. After penetrating the ridge for a considerable distance from the north the rock formation unexpectedly came to an end, and a loose bed of clay and gravel, similar to that which formed the surface of the ridge was found.

Year after year the quarrying went on, from the east, from the south, and from the southwest, until about 1880, when the remarkable discovery was made that here in ages past an excavation eighty feet in length from east to west, sixty feet in width from north to south and eighteen feet in depth, had been formed, nearly all of it in the solid rock. The soil and gravel washed from the slope above had filled it nearly to the top and thus obliterated all external evidences of its existence.

The lower layer of stone, six inches thick, had been left for the floor. In the southeast corner of the excavation this lower strata of stone for about four feet square had been removed. Water issued from the ground at this place and the indications were that a spring or well was located here. This water now flows from the ground lower down on the hill.

The huge pile of earth and gravel which filled this excavation was removed to make the filling about the Santa Fe round house and freight depot—all save a small pile which still remains to mark the site of this wonderful work of prehistoric man.

The stone excavated by those ancient people in making this fortress had been thrown out over the side of the ridge and into the creeks on either side. Mr. Trimmer, when he commenced operations here was surprised at the amount of loose stone found in the vicinity. Hundreds of loads were hauled away, much of it for the purpose of macadamizing Main street.

For what was this great pit made? The general conclusion will be that it was intended for a fortress. But if so, why was it made so deep? Prehistoric excavations of this character, made in the solid rock, while quite common in Europe are almost unknown in America. In all the standard archæological books we find mention of numerous forts, but they are usually made of earth or loose stone walled up. Hence we have had right here in Atchison something that may yet startle the archæological and scientific world. It is a pity that this wonderful work of prehistoric man could not have been preserved intact, but unfortunately it was not discovered until the stone surrounding it had been removed to a great extent.

When was it made? Centuries before the white man came; centuries, perhaps, before the red man came. Mr. Trimmer, who was here when the first quarry was opened, who personally superintended the removal of all the stone and earth from the ridge, and who is better qualified to make an estimate of its age than any other man, is confident that at least a thousand years have passed since it was formed.—From Missouri Valley Farmer, March 29, 1893.

VANDALISM AMONG THE ANTIQUITIES OF YUCATAN AND CENTRAL AMERICA.

[BY M. H. SAVILLE, ASSISTANT IN PEABODY MUSEUM, HARVARD UNIVERSITY, CAMBRIDGE, MASS.]

[From Science, Vol XX, No. 517, P 365.]

The ancient buildings and sculptures of Yucatan and Central America have within a few years been much damaged and disfigured by the indifference of the natives of those countries, and by the vanity of travellers, some of them unfortunately American, who paint their names in large characters on the sides of the buildings and carve them on the sculptures.

Briefly, I will enumerate a few instances that have come under my personal observation.

The magnificent "House of the Governor" in Uxmal, probably the grandest building now standing in Yucatan, is almost covered with names on the front and on the cemented walls inside. These names are painted in black, blue, and red, and the letters are in some cases twelve inches high, and here are to be seen the names of men who are widely known in the scientific world. The "House of the Dwarfs" in the same city has suffered in a like manner. Many of the sculptures which have fallen from the buildings in Uxmal have been wilfully broken, and I noticed particularly that two of the beautifully carved turtles from the "House of the Turtle" had been broken apparently by a machete.

The large face figured by Stephens in "Incidents of Travel in Yucatan," Vol. II., p. 434, is a mound in the backyard of a shop in Isamal. This has been almost destroyed. The whole of the face between the eyes and the lower part of the chin is gone, and I was told that the stones thus obtained were used in repairing a fence. On the other side of this mound is the bas-relief in stucco discovered by Charney, and this is slowly crumbling away. The steps leading up to the top of the Great Pyramid are being thrown down; and many mounds in Yucatan are being destroyed at the present time to furnish building material. In fact, if a bee's nest should be found in one of the old buildings, the Indians would tear down part of the structure to get at the honey.

In Copan, when the Peabody Museum Honduras Expedition compared the condition of the "Idols" today, with the photographs taken by A. P. Maudslay seven years ago, it was found that during that time some of the very finest sculptures had been disfigured by the blows from machetes and other instruments. The Stela given as a frontispiece in Stephen's "Incidents of Travel in Central America," Vol. I., has been much marred by some one who has broken off several ornaments and a beautiful medalion face from the northern side. One of the faces and several noses have been broken off from the sitting figures on the altar figured by Stephens in the same volume, opposite page 142. On some of the idols and altars names have been carved, notably on the back of the Stela figured opposite page 158 in Stephens, and a large fragment has been broken from the same Stela. While excavating in one of the chambers of the Main Structure we uncovered a beautiful hieroglyphic step, but before we had time to secure a photograph of it, some visitor improved the opportunity while no one was about to break off one of the letters.

In Quirigua a small statue, discovered by Maudslay and removed by him to a small house near the rancho of Quirigua, had the head and one of the arms broken from it during the interval between two visits. This statue was of the highest importance, as it very much resembled the celebrated "Chaacmol" now in the Mexican Museum, but discovered by LePlongeon at Chichen Itza. One of the Stelæ at Quirigua has had a name carved on it quite recently; but the sculptures of this place are in a much better state of preservation than those of Copan owing to their being at some distance from the road, and being covered with a dense tropical growth: while those of Copan are within a mile of the village, and there was formerly a road over the Plaza Grande and among the idols. The burning of the bush, to clear the land for milphas, has also injured many of the sculptures owing to the cracking of the stones by the heat.

While in Nicaragua I learned that the sculptures on the Island of Zapatero in Lake Nicaragua have within a few years been much broken and disfigured. These were described by Squier in "Nicaragua, Its People, Scenery, Monuments, etc.," Vol. II.

As the governments of Mexico and the Central American republics are making little or no effort to preserve or care for the antiquities within their boundaries, it remains for the United States to do something to preserve these vanishing memorials of the past. The initiative has been taken by the

Peabody Museum, Cambridge, which has been granted, for ten years, the care of the antiquities of Honduras. A wall has been built enclosing the principal remains in Copan, and a keeper has been placed in charge with strict orders to allow nothing to be destroyed or carried away. Thus a strong effort is being made by the Peabody Museum to protect the wonderful carvings in stone of the ancient city of Copan.

◆

A CHINESE SWORD.

The curios of China have furnished a topic for a most interesting document communicated by United States Consul Bedloe, of Amoy, to the Department of State. Not least valuable among such articles are the native swords, for the purchase of which a golden opportunity is afforded from now on for the next five years. The market as never before contained and never will again contain such an assortment as at present, with respect to beauty, historic value, or workmanship. The reasons are very simple. The opening of China and Japan to the outside world and the introduction of Western firearms dealt a fatal blow to the swordsmith's industry. Up to that time the makers of swords formed the wealthiest and most powerful guild in the East. The mediæval rivalry between Milan, Toledo and Damascus was magnificent alongside of that of the great armorers of the Orient. Competition caused experiments in metallurgy, alloying, forging, and tempering that produced results of high value and disclosed mechanical secrets to the workers in steel that are unknown to the best cutlers of Europe and America today. They produced blades with perceptible tints in violet, blue, green, red, silver and gold. Saladin's sword, that would cut a veil or a cushion, and Richard Cœur de Lion's, which would sever a steel mace, could have been duplicated in a hundred shops in the days of Shogunate and the eighteenth-century mandarins. Upon the sword art ran mad. The smith learned to arrange the fibres of the metals so as to form geometrical patterns, the figures of flowers, fruits and leaves, and even Chinese characters. The effect is the same as that produced by the magic mirrors of Japan, but how it is made no one knows.

Under the ancient regime every nobleman, high and low in Japan, was attended by two-sworded men-at-arms. In 1860 there were at least 400,000 such "two-sworders" in that country. The revolution of 1868 changed all this in a twinkling. Sword-wearing, except by policemen and soldiers, who had the ordinary Europenn weapons, was made a crime. The two-sworder lost his occupation, and his tools of trade were locked up as mementos of the golden past. The consequence is that young Japan is putting the weapons of his sires and grandsires in the curio shops to exchange them for yen and sen, the dollars and cents of their mint. In China the mandarin has sold his grandsire's blade and carries an umbrella instead. So many have taken this course that the market is more than glutted. Two-thirds of these weapons have tasted blood. Many of them are superb works of art. The prices are absurdly low, and fifty cents will sometimes procure a sword such as Broadway dealers have frequently sold for $50.

A word of caution is given as to Oriental swords and daggers. Many of them are poisoned, so that a mere scratch will cause death. The venom is produced by steeping the blade in decayed human blood, and it is one of the deadliest known to science. The short stabbing daggers used chiefly by pirates are among the most remarkable Chinese weapons. One pattern looks like a queerly-made ace of spades fastened into a wire-bound handle. For artistic effect the armorer has hollowed out a shallow, spoon-shaped concave on either side of the blade and filled it in with blood-red lacquer, the effect of which when the dagger is suddenly drawn from its black sheath is very startling. Another style of dagger has a blade shaped like an ace of diamonds and adorned with red lacquer work to represent drops of blood and gouts of gore. Another sort of dagger has a long handle and can be used as an axe. It is a favorite weapon with the Black Flags and other outlaws, who also throw it with fatal precision.

One of the most curious of Chinese swords is only about two feet long. When drawn from its shagreen scabbard the blade divides into two, both double-edged and spear-pointed. But the most dreadful-looking weapon of all is the executioner's sword, long, almost straight, very heavy, and keenly edged. It is used with one hand. Such a sword was offered to Consul Bedloe for $200. A new one of the same kind could be bought for $10, but this particular weapon bore on the blade near the hilt characters making record of 193 human lives which it had taken away.

Of weapons of other kinds there is a remarkable variety in the curio market. On the coast of China the soldiers are armed with the latest rifles, but in the far exterior they employ the same arms as were used by the hosts of Tamerlane and Zenghis Khan. The collector can find in use today in the empire every weapon that has been employed within its borders since the time of Confucius. The mandarins and high officials, too, equip their retinues with conventional arms representing different periods in the history of the nation. Many of these martial instruments look very absurd now—as, for example, the pole with a hook like a reaper's sickle on the end, which the Mongol Tartars used to wield in fighting on horseback. With it they would pull a rider from his steed or hamstring his his horse at a single stroke. This pole-hook is carried by footmen now in the retinues of nearly all of the great nobles. Another of these out-of-date weapons is a trident, exactly resembing the instrument employed by fishermen for spearing eels. Yet another is a three-pronged hay fork.

Some Chinese spears, such as were used by the Black Flags against the French in Tonquin, are grooved to hold poison. These weapons are thrown with great skill by the natives. Lee-Yu, a famous bandit, could throw one through a man at fifty yards. In the Franco-Tonquin war a Black Flag drove one of these spears clear through two French infantrymen. In archery the Chinese have long been experts. Most remarkable of their bows are the "tiger bows." These are very large and heavy and are fastened to a framework near a path or road frequented by tigers or other large animals. It requires two men to set them, and the bow is so arranged that the touching of a cord stretched across the road shoots the arrow. The force is so great that the shaft frequently comes out of the other side of the tiger, deer or buffalo. To insure success, the arrow is usually double-barbed and poisoned. On the mainland opposite the island of Amoy these bows are in constant use and annually kill at leaft fifty tigers.

In the south of China armor for warriors used formerly to be made out of many thicknesses of alternate calico and paper. This seems absurd, but in fact it is superior to steel in some respects for this purpose. Thirty thicknesses of calico and paper will resist a rifle bullet at a distance of 100 yards. A spearman who thrusts his weapon into a man clad in this kind of garment can neither wound his enemy nor extract his spear. The suit of a famous Yun-Nan bandit consisted of sixty thicknesses of cotton cloth and paper and made him practically invulnerable. Such suits are comparatively light, very durable and extremely cheap. Scale mail was brought to high perfection in China at an early period. The scales were applied at first to leather or cloth as spangles are to gauze, and later as tiles are to the boards of a roof. They were composed of iron, pewter, silver or gold.—A correspondent in Philadelphia Times.

THE ARCHAEOLOGIST.

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J. R. NISSLEY, C. F. CAUSEY, M. D.
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EDITORIAL.

The Last of a Noble Race.

A few months ago was committed a most dastardly deed. The ruffian who claims to be president of the combined states under the name of Mexico, and who is named Diaz, ordered one, who no doubt is one of his own kind, and called Raugel, a general in his army, and 1,200 of his soldiers to proceed to Tomocnio, the home of the Tomocnien Indians, a peaceful band of people living in the mountains of Chihuahua, and kill all on sight. When Raugel and his soldiers reached Tomocnio they found the Indians, old and young, large and small, gathered together and worshipping in their temple. The soldiers were at once ordered to storm the building and spare none in it. Men, women and children were alike assassinated.

It may seem cruel to write it, for the poor soldiers who were accessories to this deed were compelled to the act, but the writer is pleased to say that before the end came nearly 400 of them were killed. 'Tis a pity that the author of this black deed and his officer were not of the number. Can civilization calmly condone an affair like this? Wherein lies the power of one human being to command the destruction of hundreds of human lives? And that in a country claiming the name of a Republic! A sunny gleam shines through this awful affair for we are told that all honorable and decent Mexicans are horrified and call it a second Alamo.

And why were these people so cruelly slaughtered? They dared to defy this monster in human form in not paying the heavy taxes he saw fit to impose upon them.

This band of Indians was the last of that noble race of Aztecs living in Mexico, who had already attained a high civilization when the Spanish adventurer Cortez and his robber gang landed upon its shores, and who at once proceeded to invade the country, and in the name of religion, murder, rob and carry into captivity thousands of its inhabitants. Nor was this enough. Over-zealous priests accompanying this incursion proceeded to destroy their works of art, their books, etc., because of the belief that Satan had been there before them and was the cause of their advanced attainments. The cross, an ancient Aztec symbol, way destroyed wherever found because they believed it the work of the Arch-fiend. What an immense amount of information forever lost could have been obtained had their books and other matter destroyed been sacredly kept for the benefit of future generations. Mysteries dark which have for years caused so much discussion might have been easily solved.

Had it it not been for Torquemada, a Provincial of the Franciscan order, who came to Mexico about the middle of the sixteenth century, and who, during his residence there of fifty years, collected much of their history from early missionaries, and from such monuments as the fanaticism of his own countrymen had not destroyed the little that we do know would also have been lost. Too much credit cannot be given to this learned man.

A. F. BERLIN.

CORRESPONDENCE.

A Mound in Upshur County, West Virginia.

ED. ARCHÆOLOGIST:

On "Sauls Run," near Lorentz, in Upshur conuty, West Virginia, is a degraded mound, about two and one half feet in height and some fifteen or twenty feet in diameter, which might, if carefully examined, yield something of archæological interest.

A few years ago the neighboring farmers went at night and sunk a small shaft near the center of this mound, and found numerous flints, and near the bottom found "several poles resembling hand-spikes".

Perhaps this mound is the remains of an earth lodge, or store house of the hunter bards of Indians who resorted to this region in quest of game; or it may have been erected to serve other purposes, perhaps sepulchral or monumental.

In earlier days it measured five or six feet in heighth, and was very symmetrical in form.

The presence of timber used in its construction certainly is evidence that it can lay no just claim to a hoary antiquity.

Beads of a decidedly modern character have been picked up on and about the mound, but—perhaps for want of careful examination—none were found in the excavation alluded to.

The early settlers told many weird stories of ghosts and supernatural apparitions in connection with this lowly mound.

One was to the effect that if a stick was thrust into it and left there until nightfall unearthly shrieks and fearful screams would issue therefrom until the perpetrator of the outrage unable to endure the frightful disturbance would remove the stick and fill up the hole when the unaccountable noises would cease.

Such stories, absurd though they be, secured the mound for several years from the obliterating influence of the plow.

It is to be regretted that such legends in time lose their pristine power to preserve inviolate the antiquities of a mysterious and lost people.

L. V. MCWHORTER.

ED. ARCHÆOLOGIST:

On April 29, 1893, while some workmen were digging a drain on St. Joe Avenue, in Lakeside, a suburb of Fort Wayne, Ind., 28 miles south of here, they were surprised to find the bones of a human foot protruding from the soil. Further excavation revealed the entire skeleton, which proved to be that of an aborigine of large stature. The skeleton was perfectly preserved and was undoubtedly that of a chief, as was evidenced by the property found burried with it. It lay face downward and measured six feet and six inches from crown to sole. Around the neck was a strand of silver beads strung on a silver wire, and buried by its side were found tomahawks, axes, knives and the iron of a flint-lock musket. Near the head, in a metalic kettle, were found over five hundred pieces of silver from the size of a gold dollar to that of a dime; but no inscriptions were on them to show their date or purpose. The relics are to be preserved with the hope of ascertaining, if possible, who the chieftain was.

Lakeside, where the bones were found, is historic ground. It lies at the confluence of the St. Joseph and the St. Mary's rivers, where they join to form the Maumee. On the west bank is the site of the old fort established by "Mad" Anthony Wayne, and from which the city takes its name. Where Lakeside now lies was the scene of the fight of Gen. Harmer with the Indian tribes. Many relics of this historic battle have been unearthed, such as rusty swords, muskets, brass buttons, arrow and spear-heads, and other stone implements. I have in my collection a fine steel tomahawk, but slightly corroded, a grooved copper hatchet, some arrowheads and a few square flints, resembling gun-flints, that were dug up there about a year ago. Many skeletons have also been unearthed. The latter have invariably been those of Indians, though not within the memory of any person now living has there been an Indian burying ground in that vicinity.

Waterloo, Ind. A. C. Gruhlke.

Arrowheads in Kansas.

Ed. Archæologist:

There are very few Indian arrowheads in this part of Kansas. I have seen several large flints that may have been spearheads. They were six inches long and two and one-half inches broad at larger end, and were made of yellow jasper. They were ploughed up by one of my neighbors.

Another person residing near often tells me about the Indians with whom he lived in Indiana. Among other things of interest he often speaks of the mounds made by them. He told me that the Indian women would hoe all the ashes, bones, and even surface dirt off their village ground, and carry it outside the camp, throwing it together on a heap. He saw piles from four to six feet high made in this manner. This may be well known, but I never saw it in print. I think this manner of building will account for a great many of the small mounds and their contents. L. M. Reynolds.

Burr Oak, Kan.

NOTES.

Myth of the Cliff Dwellers Exploded.

The fable of the so called cliff builders and cave dwellers as a distinct race or races has been absolutely exploded in science. The fact is that the cliff dwellers and the cave dwellers of the southwest were Pueblo Indians, pure and simple. Even a careless eye can find the proof in every corner of the southwest. It was a question not of race, but of physical geography.

The Pueblo cut his garment according to his cloth and whether he burrowed his house or built it of mud bricks or cleft stone, atop a cliff or in caves or shelves of its face, depended simply upon his town site. The one inflexible rule was security, and to gain that he took the "shortest" cut offered by his surroundings. When he found himself—as he sometimes did in this volcanic range—in a region of tufa cliffs he simply whittled out his residence. In the commoner hard rock canyons he built stone houses in whatever safest place. In the valleys he made and laid adobes. He sometimes even dovetailed all these varieties of architecture in one and the same settlement.—C. F. Lummis in Scribners.

* * *

Siwash Indian Canoes.

Shaping a Log Into a Trim and Pretty Boat without Tools.

"While visiting one of the small towns along Puget Sound," said J. M. Mallett, of Helena, "I was greatly interested in the way the Siwash Indians built their canoes. It is really wonderful how these dirty aborigines can, with the crudest means and with a few days' work, convert an unwieldly log into a trim and pretty canoe. One Monday morning I saw a buck building a fire at the base of a large cedar tree, and he told me that this was the first step in the construction of a canoe that he intended to use upon the following Saturday. He kept the fire burning merrily all that day and far into the night, when a wind came up and completed the downfall of the monarch of the forest.˙ The next day the buck arose betimes and, borrowing a cross-cut saw from a logger who was absent on a drunk, cut the trunk of the tree in twain at a point some fifteen feet from where it had broken ofi, and then, with a dull hatchet, he hacked away until the log had assumed the shape of the desired canoe. In this work he was helped by his squaw. The old fellow then built a fire on the upper side of the log, guiding the course of the fire with daubs of clay, and in due course of time the interior of the canoe had been burned out. Half a day's work with the hatchet rendered the inside smooth and shapely. The canoe was now, I thought, complete, though it appeared to be dangerously narrow of beam. This the Indian soon remedied. He filled the shell two-thirds full of water, and into the fluid he dropped half a dozen stones that had been heating in the fire for nearly a day. The water at once attained a boiling point and so softened the wood that the buck and the squaw were enabled to draw out the sides and thus supply the necessary breadth to beam. Thwarts and slats were then placed in the canoe and the water and stones thrown out. When the steamed wood began to cool and contract, the thwarts held it back and the sides held the thwarts, and there the canoe was, complete, without a nail, joint or crevice, for it was made of one piece of wood. The Siwash did not complete it as soon as he had promised, but it only took him eight days."

* * *

Aboriginal Picture Rocks.

It has been observed that there are aboriginal picture rocks in Kansas, similar to those found in prehistoric Montezuma. Prof. Williston, of Peabody museum, says that he noticed curious carvings on the chalk cliffs along the Smoky Hill, Solomon and Salina rivers. It is reported that a cave near the town of Toronto has peculiar carvings on the walls. In many places, pictured on the rocks of Kansas, is the trident, an emblem with which the Zunis and Pueblos are familiar. The Pueblos claim to have records that date back more than 9,000 years. According to their tradition they were a seafaring people and were driven inland many thousand years ago. Can it be that the trident emblem was pictured on the rocks of Kansas by the Zunis or Pueblos? It may be so. Archæological investigation can alone make the revelation. Other carvings on the rocks in various parts of the state consist of various representations of birds, fishes and numerous other figures. These engravings are generally found on high cliffs and on rocks that stand out prominent. It is reported that there are some curious engravings on a rocky cliff on Deer creek just north of Atchison and a Champion reporter was told that near Forest park is a rock with a bird and other figures pictured on it.—From Atchison Daily Champiom.

* * *

Among the Babines, who dwell to the north of the Columbia river, a large under lip is regarded as a type of beauty. A small incision is made in the lip during infancy and a fragment of bone inserted. This is replaced from time to time by larger and larger fragments, each operation being attended with severe pain, and at length pieces of wood measuring not less than three inches in length and one and a half inches in width, are inserted, causing the lip to protrude to a frightful extent.

A similar custom exists among the Paraguay Indians, and the labnets worn by the Botocudos are inserted in a slit made in the lower lip. A Botocudo has been noticed to take a knife and cut a piece of meat on it and tumble the meat into his mouth. Among the Hydahs (Queen Charlotte Island,) it is cosidered a mark of the lowest breeding to be without this labial ornament of the lower lip.

When a young woman and an old one quarrel the elderly dame will reproach the younger one with her youth, inexperience and general ignorance, pointing, were further proof necessary, to the inferior size of her lip. This lip of beauty is not, however, peculiar to these aborigines, but is common among some of the African tribes. The Berrys, for instance, who inhabit Sanbriat, a tributary of the Nile, insert in the lower lip a piece of crystal an inch in length.

The Bougo women in a similar way extend the lower lip horizontally till it projects far beyond the upper. The mutilation of both lips is observed among the women of Kadje in Segseg, between Lake Tsad and the Beuwe.

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Secretary's Report.

Owing to the change of owners of the official organ, the general confusion consequent to our holding no convention or election, and my inability to give the association business sufficient attention, no report has been published since September last.

Many applications have been received, and to the applicants I can make no further apology.

While willing to do all in my power to serve the interests of our Association I have been unable to be more than a hindrance for a year past.

In the last published report were the following applications, now new members:

NEW MEMBERS:

69. M. R. Hayne, 410 Park St., Akron, Ohio.

70. Geo. W. Racey, East Cumberland Gap, Tenn.

71. G. G. B. Greenwood, Minerva, O.

APPLICATIONS:

Mrs. Fannie B. Ward, Kent, O.;
Ref., A. C. Gruhlke, Waterloo, Ind.

C. Annie Bowman, State Ind. Home, Chillicothe, Mo.;
Ref., L. V. McWhorter, Berlin, W. Va.

Miss Anna F. Rice, 26 Prospect Ave., Wollaston, Mass.;
Ref., Brevoort Butler, Enola, Miss.

William J. Luck, Adrain, Mich.;
Ref., A. C. Gruhlke, Waterloo, Ind.

Frederick G. Hillman, 135 Willis St., New Bedford, Mass.;
Ref., E. J. Rockwood, Worcester, Mass.

John R. Kirksey, Brindletown, N. C.;
Ref., J. R. Nissley, Ada, O.

Ernest E. Eckert, Elk Point, S. Dak.;
Ref., Mrs. Carrie A. Kirk, Elk Point, S. Dak

Lucius E. Slocum, Cumberland, R. I.;
Ref., A. F. Berlin, Allentown, Pa.

S. W. Collett, Alexandria, Ind.;
Ref., A. C. Gruhlke, Waterloo, Ind.

H. G. Jennerson, Box 208, Salina, Kan.;
Ref., C. Y. Roop. Supt. City schools, Salina, Kan.

C. E. Johnson, Montgomery, Mo.;
Ref., Montgomery Co. Bank.

James D. Stansbury, 134 S. Broadway, Baltimore, Md.;
Ref., William A. Mills, D. D., 124 S. Broadway, Baltimore, Md.

As my papers have been moved the above may not be in the order in which they were received, and in order to abridge the list but one reference has been given in each case.

Mr. E. L. Davis, Tullahoma, Tenn., No. 51, resigns, as he has no time to continue this study, and Mr. B. W. Kumler, Parker, S. Dak., formerly No. 31, wishes to resume his connection with the association.

As it has been impossible to elicit any response from E. J. Sheridan, the treasurer, A. A. A., a number of members have remitted dues to me. I have received $13.50, and also have a number of bills for expenses against the same.

I believe that Off. Ed. Richmond and Librarian Perkins also have unpaid bills against the Association Treasury.

As no communication could be had with the treasurer, I deemed it useless to notify members of dues in arrears.

A number of members also state that they have receipts of dues from Mr. Sheridan, of which he has never notified me. I believe that nearly the entire membership is in arrears since September, 1892.

There are sixty-six names now on the rolls, but a number of these have failed to respond to calls for dues and should be dropped. I am satisfied however that the greater bulk of our membership is good material and will wear well.

The Columbian Exposition now at hand should be a stimulus to all archæologists, and if a convention could be held at that time it would, I think, be a great help to the Association.

Please send your views on this and any other subject which presents itself to the editor of this magazine.

Albert B. Farnham,
Sec. A. A. A.

Charter member 10.

Our New Treasurer.

We have been notified by the board of trustees that they have appointed Mr. L. V. McWhorter, of Berlin, W. Va., to act as treasurer for the association until the one to be elected at the next election shall have qualified, and they request that members pay their dues to him for the current year, as the association is in need of funds to meet expenses. They also request that members hurry up with their nominations for officers as per announcement in last issue. Those heard from so far have expressed themselves in favor of Chicago, and the latter part of August, as the place and time for a convention. All those expecting to attend the covention will please notify Mr. Wigglesworth. A. C. G.

EXCHANGE DEPARTMENT.

Exchange notices pertaining to archæology, not exceeding 35 words, will be inserted free for all regular subscribers.

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The Archæologist.

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AN EXPLORATION OF THE REGION OCCUPIED BY THE CLIFF DWELLERS.

[BY THOMAS GORDON KING.]

A great deal of literature has appeared upon the ancient Cliff Dwellers of the southwestern part of the United States. Some of it is good, much of it is bad. The World's Columbian Exposition will endeavor to give the public an idea of the homes, utensils, implements and burials of these peculiar people. The State of Colorado will make an interesting display of the ruins found in the southwestern part of its borders.

In the early seventies the government sent an expedition into the San Juan valley for the purpose of studying the geology of the Colorado and San Juan canons. Two of the members of this survey, Messrs. Jackson and Holmes, made an examination of the ruins found upon the table-lands and in the gorges. Their report is the most extensive one which has been published concerning the region. Baron Nordenskiold, a distinguished European scientist, has in preparation an exhaustive treatise. A great many hasty observers have essayed to make an exploration of the country, but none of them have equalled in scientific importance or thoroughness the work done by the gentlemen just named.

The Cliff Dwellers are a most interesting aboriginal people. While, as I have previously stated, much has been written about their relics and implements, no one has essayed to deal with them as a people, to compare them with surrounding tribes. I am not aware that any one, save the competent gentlemen connected with the Bureau of Ethnology or the Smithsonian Institution, has studied their pottery, their mortuary customs, their workings in flint, their textile fabrics and basket work.

Hasty explorers of the ruins have lost sight of the great generalities with which the anthropologist deals. I do not think that the people of the southwest, much less those travelers who have hastily passed through the region, appreciate or understand the importance of the legacy which the Cliff Dwellers have left to them. There was no more fascinating or stranger tribe upon the American continent in Pre-Columbian times than these simple folk. They are most interesting to the archæologist, for they played an important part among the pre-historic tribes of this country. They should be studied by competent authorities, and it should be deplored by all intelligent people that the laws of the United States permit travellers and adventurers to destroy the ruins and carry off the relics. We can only learn concerning their manners, habits and customs from a careful study of their architecture, their burials and such objects as pertain to their everyday life. When dwellings are torn down and the contents removed, the anthropologist is put to no end of trouble. He must travel from one city to another to study private and public collections, and it is hardly probable that he can find sufficient material upon which to base satisfactory conclusions.

The expedition which left New York in February of last year labored under many difficulties. Those who sent it out were unable to meet its expenses, and the young men in charge were compelled to utilize their own funds in order to carry the survey to the end. But in spite of these difficulties it accomplished good results. It covered 1,600 miles overland, thoroughly explored, photographed and surveyed all the principal ruins of the San Juan valley (except those in southwestern Colorado). examined ruins lying between Bluff, Utah, and the Colorado river, opened numerous graves and explored many ruins of mesa and canon.

The first large ruin lying southwest of Durango is found at Aztec. N. M. It originally consisted of some seven hundred ruins, which were built together just as the Pueblo and Moqui Indians build their tenement houses at the present day. Although many of the Pueblos are modern this one was unquestionably ancient, and was occupied before Coronado and his followers marched northward in search of the fabled seven cities of Cibola. There was no evidence either in the graves or about the ruins that the inhabitants had any knowledge of the Spaniards. The pottery, the stone and bone implements and everything pertaining to the building was primitive. The country for a mile about this great ruin is intersected with irrigation ditches. The people were agriculturalists. I need not enlarge upon the character of the Pueblo, as such structures are doubtless familiar to all the readers of this journal. It was made of soft sandstone blocks, which could be easily cut with a stone axe. The beams and logs of the floors and ceilings showed unmistakable signs upon the ends of having been cut with stone tools.

The valleys of such streams as the Animas, La Plata, McElmo, Mancos, Recapture, Montezuma, Cotton-Wood and Halletts (all tributary to the San Juan) are lined with boulder ruins, pueblos, and, where there are canons, with cliff houses. These pueblos are generally small. Upon the La Plata they seem to have existed in towns or settlements,—say twenty or thirty buildings of two to six rooms each, in a group. All boulder ruins seem to have been different buildings or poorly constructed residences. This is merely a matter of conjecture. The boulder ruins accompany the pueblos, and the exploration of them sometimes yields skeletons and pottery, but more frequently nothing is found to indicate the purpose for which they were erected. While theories may be constructed concerning them, the archæologist who deals calmly and carefully with facts is honest enough to say that no one knows anything about the boulder ruins.

The cliff houses can be only caves formed in the sides of the canons. The walls of every canon are composed of rock. This rock is usually a soft sandstone. It is acted upon easily by wind and rain and other atmospheric agencies. The winds of the SanJuan country at certain times are very severe, and carry a great deal of sand in the air. It is easily seen how this drifting sand could wear in the course of time a considerable cavern in the face of any cliff. Other cliffs have been formed by large masses of rock, through which fissures or seams run, becoming weaker and falling from the parent ledge. The upper strata is usually harder than the lower, and hence the underlying parts weather or break off much more easily than those at the top.

The caves vary from small ones, eight feet high and twenty feet long, to enormous caverns as large as any railroad station in the country. The cliff houses are built, as a matter of course, according to the size of the caverns. The small caverns contain two or three rooms, the large ones, ten or twenty, or perhaps one hundred. The architecture of the cliff houses resembles that of the pueblos. Many of the doors and ventilators are similar to those found in buildings along the water-courses upon level ground. The pottery is very much like that dug up in the graves accompanying the pueblo burials. The difference lies in the crania of the two peoples. One flattened the base of the skull by artificial pressure, the other did not; the one irrigated and raised vegetables to a large extent; the other did the same so far as the narrow margin on either side of the stream at the base of the canon permitted. The cliff dweller domesticated the turkey and the goat. He wove cotton cloths and made feather robes somewhat like those made by the Mexican tribes or the South Sea islanders.

Many of the cliff houses are placed in exceedingly strong positions. Armed as were all American tribes of pre-Columbian times, I am unable to see how some of the caverns could be assaulted with any degree of success. The inhabitants might have been starved out, but it is obvious that they could not be driven out. The American savage has shown by the graves and shell-heaps of the New England coast, the mounds of the Ohio valley and of the south, that he was a confirmed warrior. He was a warrior when Cortez carried on his conquest in Mexico, he was a warrior when Miles Standish conquored the tribes of New England, he was a warrior when the plains were settled, he is a warrior today at Pine Ridge Agency—and the rule holds good in the case of the cliff dweller. He selected his fortresses from necessity rather than preference, for he was an agriculturalist. But at the same time he was not the timid personage indicated by the dreamer. He could defend his home when necessary, and there is every evidence that he did defend it, and defended it heroically.

Many of the houses are located fifty or sixty feet above the base of the canon. A few of them are two or three hundred feet above the bed, but in the case of those placed up so high there is always a talus or pile of debris at the foot of the wall, by means of which one can ascend to within twenty or fifty feet of the house. Those houses which have been described by hasty observers as being "always inaccessible" were found by the recent expedition to be inaccessible because ledges or rocks which the builders used as a means of access had fallen from the face of the cliff. The cavern was not inaccessible when the cliff dwellers inhabited it, but has become inaccessible through natural agencies since the inhabitants departed. If men would only use a little common-sense in making observations upon these people, the archæologist would not have so many mistakes to rectify and the public would be saved much speculating concerning mythical occurrences.

The cliff houses found northwest of Bluff, Utah, are very interesting. The expedition ascertained that but few people had visited some of them, and many of them had never been entered since they were deserted. In some of these, turkey-dung covered the floors to a depth of several feet. This dung was nearly as dry as powder. Scattered through it were pottery sherds, sandals of rushes or fibre or bark, pieces of baskets, bones of animals and birds used as food, and many other things which gave an insight into the every-day life of the cliff dwellers. Not a few whole vessels, a number of burials and other interesting objects were found in the ruins just as they had been left by the aborigines.

Along the Colorado River, I am informed by Mr. Charles Mac Loyd (a very competent observer) that there are many houses which have not been explored and which contain mummies, pottery, flint-points in the spear shape or in the arrow, flint knives, baskets, cotton and feather garments, etc. The mummies did not especially resemble the mummies of the Egyptians, as has been erroneously stated. They are more like the Peruvians. An incision was made in the abdomen and the softer organs removed through it. There is no evidence that the interior of the body was filled with spices or herbs. No mummy-case has ever been found. The body was often wrapped in cotton cloths, skins of animals or covered by a large basket. With the remains are placed such objects as were the property of the deceased during life. None of these finds have ever indicated that the cliff dwellers were more than intelligent savages.

It has been stated that the inhabitants of the canons possessed a written language. Many pictographs cover the walls of the houses or are found upon boulders scattered throughout the region. These represent animal and reptile forms. Prominent among them are the turkey, the goat and the snake. Trees and crescents, circles and triangles are also common. Many characters occur which are combinations of the square or the circle; but none have been found which can really be considered hieroglyphs.

The average size of the cliff houses might be safely placed at ten feet in length, twelve feet deep and seven feet high. Each room is separate and connected with other rooms by doors or openings through the partition walls. There is usually but one entrance from the canon. The boulders of the talus are some little distance below the opening, so that a ladder would be necessary in order to gain access. In other cliff houses a series of steps have been cut in the face of the wall leading from the base or from the talus to the opening. Nearly all the rooms contain loop or port holes which are plastered within with adobe mud. These point downwards and command all the approaches to the house. If, perchance, a missile should enter it would be diverted against the ceiling or wall in the rear and do no damage. The conclusions concerning the cliff dwellers might be summed up as follows:

They were a people averaging, according to their skeletons, five feet six inches in height. In social scale they were considerably above the roving Indians of the plains or mountains. They were not civilized in the general accepted definition of the word. They raised vegetables, cotton, the goat and the turkey. They were good weavers, fair architects and understood thoroughly the importance of a defensive position. They were in every sense of the word a stone-age people. No metal has been found in their ruins in any considerable quantities. Neither Mr. MacLoyd nor the Expedition found any traces of copper or other metals in the ruins. As a stone-age people they can be placed in the highest neolithic age. They seem to have had no trade with surrounding peoples, as did the Ohio aborigines. No foreign substances have been found in the ruins. They were a tribe apart and distinct from other surrounding tribes. They may have had more or less intercourse with the Pueblo dwellers, as their pottery, architecture and garden products would indicate: but there is no evidence of their being acquainted with the higher development of Mexico or Central America.

No age can be given to the cliff houses, and all statements as to "10,000 or 12,000 years of antiquity" are mere opinions and not worth the paper upon which they are written The question of age might be figured out by anatomists and geologists, but the data upon which one would have to work is very unsatisfactory. Their life as an agricultural people can be readily understood. The implements found in wooden handles in the ruins are of great value to anthropologists. They determine by what means flint and cutting tools were lashed, mounted and evident uses to which they were put.

Fortunately the arid climate has preserved textile fabrics and all delicate objects. So the student has much material upon which he can satisfactorily labor. But with all this, the material which they have left, especially in basket, feather and cotton work, is much like that of the Pueblo dwellers of New Mexico of two hundred years ago. Many of the early accounts furnished by the followers of Coronado and other adventurers would be found of great value in comparing the life of the cliff dwellers with those of the Pueblo Indians of three or four hundred years ago.

In a following paper I will describe some of the adventures met with by the expedition. This article was written with the hope of correcting some of the false impressions concerning the state of culture attained by these primitive peoples. If I have succeeded in convincing any of the readers of the Archæologist from an archæologist's standpoint, I will feel that this article has not been written in vain.

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RUINS OF QUIVIRA. THE CITY OF TEMPLES.

[BY JOS. M. HATTAN.]

The science of archæology has received but comparative little attention in America.

The reason of this is that there has been a great rush for wealth in the New World, and the vast multitude of people who left the Pompeiis and the Waterloos of the Old World at once entered in the great scramble for riches and position.

In the building up of the country was lost all desire for ruins, pre-historic man; archæology or scientific research that may at any time have existed in their intellectual composition. But now that the country is pretty well built up, our big cities about finished and millions of people in a position of wealth and comfortable circumstances, archæology and its kindred sciences considered, understood and fully appreciated only by the most highly cultured people of the world, and a science which is the outgrowth of the very highest degree of civilization, enlightenment and refinement, is destined from now on to receive from that class of American people great attention from especially Boston and other centres of the highest culture, analagous to Edinburg, London and Paris of the Old World.

Heretofore it has been too obtuse a science for the common lot of Americans, who, like a drove of buffalos in a stampede, have lost sight of all except wealth and position. Now that their desires have been gained the acquirement of culture and refinement is the next thing in order for them as a nation. And we think they will find enough to interest them in America without going abroad.

Americans had at any rate better visit America before going to the Old World to be laughed at for their ignorance of their own country and their ignorance generally. Mr. A. P. F. Coape, an English nobleman, who is here with me assisting in directing the excavations into this ruined city has spent six years in this wild part of New Mexico. We are both Englishmen and are proud to say that we visited our own country and other parts of Europe before coming to America. That is considerable more than the vast number of uncultured Americans can sây when they are found proclaiming their ignorance at Pompeii, the field of Waterloo, the Pyramids of Egypt, and other places that Mr. Coape and I have met them. They knew nothing about the Mammoth cave, Niagara Falls, The Garden of the Gods, Pike's Peak, the Yellowstone National Park, Yosemite Valley, Wyandotte cave, or anything of the wonders of the American continent. That was too near home. Pompeii and the Pyramids were farther away, and you know distance lends enchantment to the view, besides being quite fashionable too. And now it happens in the curious course of human events that Englishmen and English capital and English scientists generally are taking the lead in archæology in America. The reason of this strange anomoly is that the science of archæology is quite English and flourishes among the classes of the highest degree of culture, enlightenment and refinement only.

We have the Royal Archæological Society of London with over five thousand members; with a fine property and in a flourishing financial condition. Then there is the Gaulic Archæological Society of Paris, the Scottish Archæological Society of Edinburg, Scotland, and others in the Old World too numerous to mention.

The people of the United States being a floating, hetrogeneous, conglomerate, cosmopolitan mass with a scattering spirit of archæological and scientific culture wedged in, here and there with this unsympathetic crowd of wealth and position seekers, have no time to devote to archæological culture nor the formation of archæological bodies as are found in so great numbers in the Old World.

America now is ripe for the prosecution and study of the interesting science of archæology; the prehistoric races of America, their ruined cities and villages; the Cliff Dwellers; the mummified and petrified remains of their races; their instruments, pottery, implements, temples, mausoleums, etc., all of which Mr. Coape and I are at present unearthing, is certainly an interesting study for Americans in America. It certainly is for us English people who are members of the Royal Archæological Society of London.

It will be impossible to write a detailed description of our discoveries in this ruined city up to date. Two articles have alrealy gone to the American Press Assściation regarding all the preliminary work and discoveries up to May 9. We have unearthed considerable pottery in an excellent state of preservation. Numerous copper vessels and ornaments, some of gold and silver. We are now down to a macadamized street, and have entered a mausoleum in an excellent state of preservation, and containing eighty-four illustrious leaders of the pre-historic races, each in a sarcophagus made of agate and illuminated by obsidian or volcanic glass. Two of the subjects are petrified, and two mummified. A full description has gone to the American Press Association, New York, and if you will kindly reproduce it all in the columns of The Archæologist you will greatly oblige the writer, as he would much prefer to make archæological discoveries than to write a description of them. That is my hardest work, and I always commence an article with great reluctance. Mr. Coape throws all this part of the work on me while he pursues his archæological and scientific investigations uninterrupted.

We are firmly of the opinion that this is the city of Quivira that Vasquez Coronado came up here to seek in 1540. There was a tradition current among the people he found from the coast all the way up to Abiguiu, that there was in this neighborhood a great city with temples adorned with silver and gold. It was called Quivira, correctly pronounced "Kee-ve-rah".

Coronado found thriving cities and villages all the way along his march. He had 1,150 followers. At Santa Fe he found a city of 15,000 inhabitants. There are only 7,000 there today, 352 years later. At Abiquiu he found a town or pueblo of over 800 people. He also found copper and gold mines. He established a mission there, built a city across the river now in ruins. Copper was mined; gold also in large quantities. The city of Coronado across the Chama river from Abiquiu flourished for about fifty years. It was destroyed about 1590 by an uprising or revolt of the Peons whom Coronado and his followers held as slaves. They destroyed the city, massacred over five hundred Spaniards, and filled up the approaches to the rich mines. This neighborhood is in a financial sense therefore well worthy the attention of archæologists as well as prospectors and mineralogists.

Mr. Coape and I will be amply repaid by the intrinsic value of our discoveries for the expense of carrying on the excavations and investigations.

We firmly believe we have found what Coronado failed to find and that is Quivira, the ruined city and Pompeii of pre-historic America.

ABIQUIU, NEW MEXICO, May 19, 1893.

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AN IDOL PIPE.

[BY A. F. BERLIN.]

There is found no work of Aboriginal art which so much commands the attention of archæologists and collectors as do the pipes made by our Pre-historic North American races, and discovered in mounds, graves, and often on the surface.

Even more were they appreciated and held in esteem by their makers, which is evinced by the great amount of artistic work done upon many of them.

With our red people, even as at the present day was there no habit as universal as that of smoking. The narcotic influences of this plant gave a certain amount of solace to the smoker in his home of relaxation and rest. Nor was he without his favorite pastime even when away at war or on the chase. He believed that tobacco was of Divine origin, coming as a direct gift for his especial benefit from the Great Spirit, who himself was addicted to the habit of smoking. Says Stevens in his "Flint Chips," p. 318: "The pipe therefore came to be regarded as a sacred object, and smoking partook of the character of a moral if not of a religious acts. The incense of tobacco was deemed pleasing to the Father of Life, and the ascending smoke was selected as the most suitable medium of communication with the world of spirits." Without the presence of the pipe filled with lighted tobacco was there no declaration of war, nor made a treaty of peace, and we are told by Col. Jones in "Antiquities of the Southern Indians", p. 384, that "Among the primitive inhabitants of at least some of the Southern regions, they were elevated to the dignity of idols before whose elaborately carved forms of man, and beast, and bird, the deluded fell down and worshipped. It is only among the North American Indians that such peculiar historic interest attaches to the pipe—only among the ancient people of this region that we locate customs, ceremonies, and traditions, at once most curious and unique". In Irving's "Life and Voyages of Columbus", Vol. 1, p. 184, quoted from "Navarrete", tome 1. p. 51, we read that "When Columbus was upon the coast of Cuba he beheld several of the natives going about with firebrands in their hands, and certain dried herbs which they rolled up in a leaf, and lighting one end put the other in their mouths and continued inhaling and puffing out the smoke. A roll of this kind they called a tobacco, a name since transferred to the plant of which the rolls were made. The Spaniards, although prepared to meet with wonders, were struck with astonishment at this singular and apparently nauseous, indulgence."

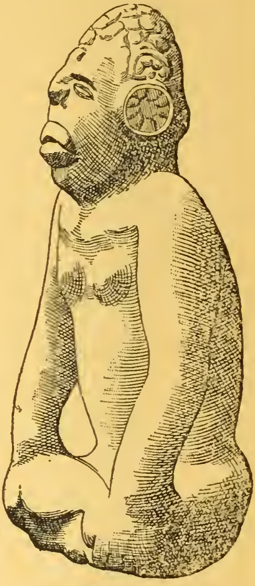

Fig. 1.

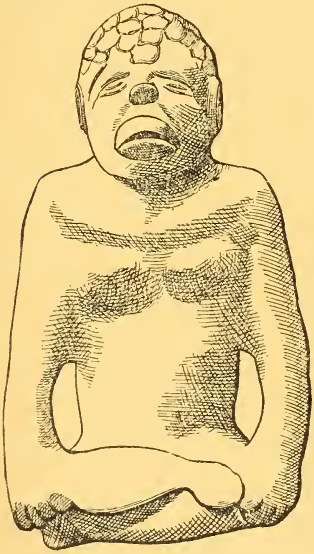

Fig. 2.

Figs. 1, 2, and 3, profile, front, and back, represent an idol pipe in the collection of C. F. Causey, M. D., Sartartia, Miss. This rare relic of aboriginal art, made of a fine grained sandstone of brownish hue was ploughed up from a low flat mound in a field ten miles from Sartartia. It is nine inches high, four inches across the shoulders, and weighs six pounds. It represents a female, devoid of dress, in a sitting posture, one leg overlapping the other with the hands clasping or resting on the knees. The face appears idiotic; the forehead retreating; the eyes closed; the mouth partly open, with heavy lips that have more the appearance of those of the negro than that of the Indian. The hair appears to have been done up in rolls, with a knot or coil at the back. The ears are covered with some kind of ornament which may have been fastened to the hair covering the side of the head. The opening for the bowl of the pipe enters immediately below the neck, with the aperture for the stem some distance further down. It is a most elaborate piece of workmanship, taking into consideration the standing of the maker: and one is at a loss to conjecture what idea was dominant in the mind of its authors.

Col. C. C. Jones appears to think that the makers of these rare pipes received their ideas of art from a civilization in Mexico. He says: "These pipes are obviously very old, and in all likely-hood antedated, by an indefinite period of time, the occupation of this valley by the Cherokees. So far as recorded observation extends, nothing like them was noted in the use or possession of the modern Indians. There are at least plausible grounds for believing that the ancient peoples who piled up these august tumuli along the banks of the Etowah,—Georgia—and departing, left behind them enduring monuments of their combined labor for a wonder and an enigma to later tribes, may have borrowed some of their ideas of sun-worship, idolatry, agriculture, and art directly or indirectly from the southern cradle of American civilization." Antiquities of the southern Indians, p. 403. The great mounds referred to above are located near Cartersville, Georgia, and cover an area of some fifty acres. The largest is 65 feet high. It is nearly quadrangular in shape, unless one takes into account a slight angle to the south. This gives it a pentagonal shape measuring at the summit, which is nearly level, on the northern side, 150 feet; eastern side, 160 feet; south-eastern side, 100 feet; southern side, 90 feet, and western side, 100 feet. East and west its longest apex diameter is 225 feet; north and south, 220 feet. In Mississippi, where was found our idol-pipe, near Seltzertown is situated a mound so large that one is almost forced to believe that it is of natural origin. It is a truncated pyramid nearly 600 feet long, 400 feet at its base, covering nearly six acres of ground. It is forty feet high, its summit of four acres being reached by a graded way.

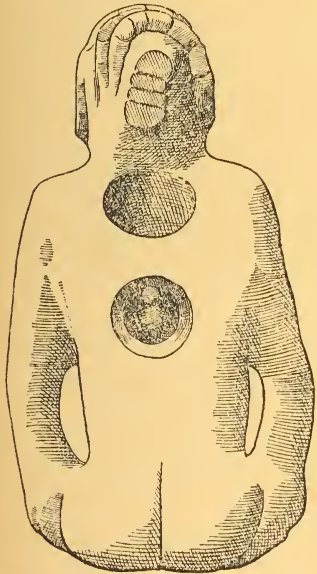
Fig. 3.

One marvels at the immensity of these stupendous works, which must have been erected by an agricultural and stationary people under some form of paternal government. Being in this condition of civilization they could certainly at their pleasure produce works of art as the idol pipe figured in this paper.

A few more words in reference to the plant which gave so much exhiliaration to our North American aboriginal people when using it may be of interest to my readers. We know that they cultivated the plant, but the question arises, where was it first found in its wild state? Botanists declare that a very lengthy course of cultivation is required so to alter the form of a plant that it can no longer be identified with the wild species; and still more protracted must be the artificial propagation for it to lose its power of independent life, and to rely wholly on man to preserve it from extinction. Now this is precisely the condition of the maize, tobacco, cotton, quinoa, and mandioca plants. * * * * All have been cultivated from an immemorial time by the aborigines of America, and except cotton, by no other race; all no longer are to be identified with any known wild species; several are sure to perish unless fostered by human care. What numberless ages does this suggest? How many centuries elapsed ere man thought of cultivating Indian corn? How many more ere it had spread over nearly a hundred degrees of latitude, and lost all semblance to its original form? Who has the temerity to answer these questions? The judicious thinker will perceive in them satisfactory reasons for dropping once for all the vexed inquiry "how America was peopled" and will smile at its imaginary solutions, whether they suggest Jews, Japanese, or, as the latest theory is, Egyptians. That the plant came originally from near the equator can not for a moment be doubted, for like Indian corn it thrives best in hot regions. The Choctaw Indians who lived in the territory now called Mississippi raised so much tobacco that at times they had a surplus to sell to traders. When using for smoking they mixed it with the leaves, and a transparent, balsamic juice, or sweet gum procured from a tree called liquid-amber. Often too, was no doubt mixed with tobacco the leaves of other plants having narcotic properties.

For the construction of his pipe, which our readers have been told the Indian valued highly, the choicest material was selected. Often did he go far away from his home to procure the stone from which he made it, and in shaping and polishing it spent much time, days and even months! He had to learn by experiment what sort of stone best withstood the action of continued heat, and as it was his almost constant companion one can easily understand why when possible he made it so elaborately, and when laid in his grave "his messenger of peace, through the stem and bowl of which he pledged his friends, was with his other implements placed into his long fancied, mild and beautiful hunting grounds." Catlin's eight years, Vol. 1, p. 235.

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AN ADDITIONAL LIST OF STANDARD ARCHÆOLOGICAL LITERATURE.

The list of "some standard archæological literature" published in the May number of this journal is an excellent one, though the author has omitted some important works, a small list of which is here appended:

BOOKS:

Lubbock, Sir John. Origin of Civilization.
Ranke, Johannes. Der Mensch.
Ratzel, Fr. Volkerkunde.
Topinard, Paul. Elements d'Anthropologie Generale.
Tylor, E. B. Primitive Culture.
Tylor, E. B. Early History of Mankind.
Wilson, Sir Daniel. Pre-historic Man.

JOURNALS, ETC.

Anthropologischen Gesellschaft in Wien, Mittheilungen. Vienna.
Antiqua. Strassburg.
Archæological Institute of America Publications. Cambridge.
Archivio per l'Anthropologia. Firenzi.
Ausland. Stuttgart.
Berliner Gesellschaft fur Anthropologie, Verhandlungen. Berlin.
British Association for the Advancement of Science. Reports.
Bureau of Ethnology. Publications. Washington.

Ceylon Branch, Royal Asiatic Society Journal. Colombo.
China Branch, Royal Asiatic Society Journal. Shanghai.
Internationales Archiv fur Ethnographie. Leyden.
Popular Science Monthly. New York.
Royal Asiatic Society Journal. London.
Smithsonian Institution: Contributions to Knowledge. Washington.
Smithsonian Institution: Miscellaneous Collections. Washington.
Zeitschrift fur Ethnologie. Berlin.

Valuable information may also be obtained from the publications of geographic and other scientific organizations too numerous to mention here.

Charles H. Huberich.

To which may be added as equally valuable to the student:

Flint Chips. Stevens.
Pre-historic Annals of Scotland. Wilson.
The Lost Atlantis, etc. Wilson.
Manners and Monuments of Pre-historic Peoples. De Nadaillac.
Prehistoric Races of the United States. Foster.
The North Americans of Antiquity. Short.
Primitive Man. Figuier.
The Primitive Inhabitants of Scandinavia. Nilsson.
The Lenape Stone. Mercer.
Indians of Berks County, Penna. Brunner.
The Ancient Cities of the New World. Charnay.
Essays of an Americanist. Brinton.
The Lenape and their Legends. Brinton.
The Mound Builders. Peet.
The Iroquois Trail. Beauchamp.
Animal Effigies and Emblamatic Mounds. Peet.
Antiquities of the Southern Indians. Jones.
Ancient Stone Implements of Great Britain. Evans.
Antiquity of Man. Lyell.
Types of Mankind. Nott and Gliddon.
A Narrative and Critical History of America. Vol. I. Winsor.
United States Geographical Survey W. of 100th Meridian. Vol. VII. Archæology.
United States Geographical and Geological Survey of the Rocky Mountain Region. J. W. Powell in charge. Vols. I, III, IV, V, VI.
Antiquity of Intellectual man. Smyth.
Lake Dwellings of Switzerland. Keller.
Indian Tribes. Schoolcraft.
Primeval Antiquities. Worsaae.
Savage Life and Scenes. Angas.
Analmae. Tylor.
Leo Palafittes. Desor.
Ten Years Diggings. Bateman.
Promenades. DeMortillet.
Natural History of Man. Wood.
The Mound Builders. Mac Lean.
The Antiquity of Man. Mac Lean.
Troy and its Remains. Schlieman.

Le Prehistorique. DeMortillet.
Cave Hunting. Dawkins.
Early Man in Britain. Dawkins.
British Barrirus. Greenwell.
Origins. Elton.
Hommes Fossiles. DeQuatrefages.
Ancient Bronze Implements. Evans,
Essays on Archæology. Newton.
Urgeschichte. Schrader.
Wanderings of Plants and Animals. Hehn.

L'Archeologie Prehistorique. DeBaye.

Rude Stone Monuments in all Countries. Ferguson.

Archaic Sculptures. Simpson.

The History of the American Indians, 1775. Adair.

Das Bronzealter. Nilsson.

The Origin of the Aryans. Taylor.

Ancient America. Baldwin.

The publications of "The Bureau of Ethnology," Washington, D. C., in charge of Major J. W. Powell, now number seven quarto volumes, filled with most valuable archaeological matter.

The publications of "The Western Reserve Historical Society," Cleveland, O., are equally interesting.

The following are the titles of works which are published as "Smithsonian Contributions to Knowledge:"

Ancient Monuments of the Mississippi Valley. Squier and Davis.

Aboriginal Monuments of the State of New York. E. G. Squier.

Description of Ancient Works in Ohio. Charles Whittlesey.

Antiquities of Wisconsin. I. A. Lapham.

Archaeology of the United States. S. F. Haven.

Mexican History and Archaeology and Zapotec remains. Brantz Mayer.

Ancient Mining on the Shores of Lake Superior. Charles Whittlesey.

On the Gliddon Mummy Case in the Museum of the Smithsonian Institution. Charles Pickering.

Archæological Researches in Nicaraugua. J. F. Bransford.

The Sculptures of Santa Lucia Cosumalwhuapa in Guatemala. S. Habel.

Prehistoric Fishing in Europe and North America. Charles Rau.

The Palenque Tablet. Charles Rau.

Contents of a Bone Cave in the Island of Anguilla, West Indies. E. D. Cope.

Remains of Later Prehistoric Man Obtained from Caves in the Catherina Archipelago, Alaska Territory, and Especially from the Caves of the Aleutian Islands. W. H. Dall.

The Archæological Collection of the United States National Museum in Charge of the Smithsonian Institution, Washington, D. C. Charles Rau.

Explorations of the Aboriginal Remains of Tennessee. Joseph Jones.

THE EDITOR.

THE ARCHAEOLOGIST.

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EDITORIAL.

An Important Discovery.

Mr. H. C. Mercer, one of the contributors to this journal, in a letter bearing date May 25th, informs the editor that he was fortunate in discovering near Point Pleasant, Bucks Co., Penn., on the banks of the Delaware river, the argillite quarries for which search has so long been made. "Eight or nine holes and tons of chips. Thirty-three 'turtle-backs' out of a hole four feet deep and four feet in diameter; about one to every bushel of chips."

This is the material from which were made the many paleolithic or rude stone implements first discovered in the gravels at Trenton, New Jersey, by Dr. C. C. Abbott, and who claims they are the remains of a rude people living in the Delaware valley when the bay of Delaware extended up to where the city of Trenton now stands. These argillite quarries do not appear to cover as much ground as do the jasper diggings at Vera Cruz and Macungie. It is evident that they were worked before the discovery of jasper, and when once this homogeneous stone came into use the manufacture of argillite implements ceased. The question arises, Was jasper discovered by the Paleolithic man of Dr. Abbott, or has this all been the work of the later Indians? Mr. W. H. Holmes, of the bureau of Ethnology, will have it that there has not yet been discovered any trace of a human being living during the glacial period, and that all the rude implements are but the rejects and unfinished implements of our aboriginal Indians.

What Dr. Abbott tells us of his discoveries bears great weight, for he is an archaeologist having world-wide reputation, and an authority who knows more about the Trenton gravels than any other living person. We hope the important discovery of Mr. Mercer will settle this much mooted question, of which so much has already been written for and against.

A. F. BERLIN.

CORRESPONDENCE.

GOOD HOPE, ILL., May 8, 1893.

ED. ARCHÆOLOGIST:

I have received the last three numbers of the Archaeologist, and have been glad to read your editorials and to notice how well posted you are on the general science. What is needed is that those who are in the field as collectors should be educated in the broad principles of archaeology. An intelligent collector, who gathers up the relics of a locality and describes them carefully, will aid very much in making up the map of this country. What we want is to make the lines between the districts more distinct. The different horizons should also be carefully marked and accurately described. I do not think that the Indian tribes known to history were the only inhabitants which have lived on the soil. The efforts to identify the pre-historic relics with any particular tribe is attended with this difficulty. It conveys the idea, that this was the only tribe that left any relics, whereas there was a sucsession of tribes, but the record of one tribe should not be mingled with that of another, for in that case we shall fail to read the history. Everyone is entitled to his own opinion, but to say dogmatically that this or that particular tribe left the relics which are found beneath the surface is unwise. The next explorer may find evidence to show that they were left by an entirely different people.

I think that we avoid these difficulties when we use the old terms such as "Mound Builders," "Cliff Dwellers," "Civilized Races," and avoid the terms Indians, etc. A city in Central America can not properly be called a "Pueblo," for it has none of the characteristics, and it is begging the question when we say that a so-called palace was a communistic house. It strikes me also that we are not far enough along to say definitely that there was only one race on the American continent. The linguists seem to be quite positive of it, but the archaeologists are not sure of it, in fact some of them doubt it seriously. We are not called upon to give ourselves away on this point. If we are, we may as well be independent and go slow. I am confident that we shall work out these problems by and by.

There has been some heat in the air and lightning in the sky, but there will be a clearer vision after the storm and we shall see the headlands in the distance. Still the outlines and terraces should not be confounded. If anyone thinks the foot hills resemble the upper heights, we must acknowledge that they belong to very different epochs and are the results of a very different order of things. The early and late periods of occupation may have been marked by similar relics, but a whole day of archaeological time may have intervened. I would assure you that every effort on your part, or on the part of your contributors to honestly and carefully work out these problems will be welcome to me, and it matters not by what medium the results reach the public so long as all are actuated by the truth-loving spirit. You have been associated with me ever since the Centennial. The era of the exposition is likely to open a wider field for each of us. I hope that we shall cooperate as before, and so welcome the new journal to the "charmed circle." Yours Sincerely,

STEPHEN D. PEET,
Editor American Antiquarian.

ED. ARCHÆOLOGIST:

In May number of The Archaeologist, Mr. Adams in his interesting article on "Wampum," states that the wampum mantle or cloak belonging to King Philip was lost sight of after the death of the Indian King.

In R. E. C. Stearns' valuable article entitled "A Study of Primitive Money," p. 17, we read that "After the defeat of the great Chief Philip of the Wampanoags, Anauan, the most trusted warrior, counsellor and friend of Philip went out quietly, brought the three or four wampum scarfs—splendid in his eyes—and gave them to his conqueror.

The trinkents were not only valuable in themselves; they also symbolized and embodied a complete submission to the more mighty men whose powers had prevailed over the Indians. The largest scarf, nine inches wide, pictured with birds and beasts and flowers, when laid over the shoulders of the sturdy Rhode Islander, swept his akles.

Another belt designed for the head carried two flags attached to it.

Governor Winslow in his letter to the king, accompanying the spoils of Philip, speaks of them as "being his Crowne, his Gorge and two Belts of their own making of their own goulde and silver."

Gold it was not; coin it was not; but the governor correctly described it as "their goulde."

Thus it appears that the sacred wampum belts belonging to the unfortunate and wronged King of the Wampanoags were carried to England.

L. V. McWhorter.

Berlin, W. Va.

NOTES.

In the quarries at Syene there may be seen an unfinished obelisk, still adhering to its native rock, and bearing the marks of the workmen's tools. Of this unfinished obelisk the Rev. J King writes in his work "Cleopatra's Needle" that it shows the mode in which the ancient Egyptians separated the immense monoliths from the native rock. In a sharply cut groove marking the boundary of the stone are holes evidently designed for wooden wedges. After these had been firmlo driven into the holes, the groove was filled with water. The wedges gradually absorbing the water, swelled and cracked the granite throughout the length of the groove. The block, once detached from the rock, was pushed forward upon rollers made of the stems of palm trees, from the quarries to the edge of the Nile, where it was surrounded by a large timber raft.

It lay by the river side until the next inundation of the Nile, when the rising waters floated the raft and conveyed the obelisk down the stream to the city where it was to be set up. Thousands of willing hands pushed it on rolles up an inclined plane to the front of the temple where it was designed to stand. The pedestal had previously been placed in position, and a firm causeway of sand covered with planks led to the top of it. Then by means of rollers, levers, and ropes made of the date palm, the obelisk was gradually hoisted into an upright position.

* * *

The Early Iron Age in Central Europe.

With the general employment of iron, a new era arose in central Europe, one which gave birth to that high culture which has since focussed there the civilization of the world. An intense interest, therefore, surrounds this remote period. History is silent about it, and archæology alone can guide us. This wondrous science reveals two diverse civilizations in that area during the early iron age, separated probably rather by a few hundred miles of space.

The first is represented by the remarkable cemetery of Hallstatt, near Salzburg. This locality discloses a people skilled in working bronze, gold, and iron, manufacturers of richly decorated and gracefully formed pottery, lovers of ornaments of amber, glass, and agate, and accustomed to cremate their dead. We may place them 500-800 B. C.

The late iron age is the La Tene period, one or two centuries before the Christian era, deriving its name from a station in western Switzerland. By that time the working of iron had reached a singular perfection; glass, gold, silver, and precious stones were frequent; the dead were buried in stone coffins, and a local coinage was for the first time issued in metallic pieces, now popularly known by "rainbow keys."

Recent studies on this period are those of Dr. Jacob Heierli, of Zurich, in the December number of the Proceedings of the Vienna Anthropological Society, who describes a La Tene station in eastern Switzerland: one by Dr. L. Niederle, in the Report of the International Congress of Pre-History at Moscow, discussing the age of iron in Bohemia: and an address by Von Troltsch between the German Anthropological Society with reference to it in southern Germany.

* * *

Enigmatical Stone Implements.

In Science, Jan. 6, Mr. Walter Hough describes a form of polished stone implement with grooved surfaces and suggests that these utensils were employed in beating out fibrous bark for clothing, paper, etc. This suggestion is not improbable, and has been accepted by some curators. In the Trocadero Museum, Paris, these stones are labeled "Armatures de maillet a battre les fibres d'agave." In the University Museum, Philadelphia, one bears the label, "Pounder said to have beed used in pounding the agave in making pulque." There is no doubt of the correctness of this identification. The Mexicans called these implements amatequini, paper beaters, from the verb amauitequi. Mr. Hough is also right in surmising that the Mexican paper was not made from the agave alone. Other materials were the bark of the "Cardia," a tree of the family Boraginaceæ, and palm leaves, hojas de palma, which Boturini says made the finest of all. An article on the amatequini may be found in La Nature, Dec. 15, 1888.

Another strange implement or ornament is the stone yokes or collars which are found in eastern Mexico. In the Internat. Archiv fur Ethnographie, 1892, Dr. Ernst, of Caracas, has an interesting article on these. He believes them to be memorial tokens of great individual achievements and worn as signs of power and dignity on certain ceremonial occasions. Mr. Strebel, who wrote an article some years ago on the same subject, entertained a similar opinion. As they are quite heavy, often weighing about sixty pounds, some have supposed they were intended to fasten the victim to the sacrificial stone, the techcatl. They are evidently not adapted for this, however. I would suggest that they were the stones used in the game of ball, tlachtli, described by the early writer, enclosing the aperture through which the ball was to be driven. Some are closed with an armature, one of which is figured by Dr. Ernst. They are to be distinguished from the stone yokes from Porto Rico.—Dr. D. G. Brinton in Science, Vol. 20, No. 527, p. 133-4, March 10, 1893.

* * *

A force of two hundred workmen have just excavated at the old city of Mynae the foundations of an ancient temple, mentioned by the blind poet, Homer, as having been destroyed by fire 423 B. C. much of great interest to the antiquarian was unearthed.

* * *

Our vast state of Texas has produced a prehistoric monument that fairly startles the archaeological world, and may give birth to a new theory as to the original settlement of the new continent. A wandering investigator came upon a wall twenty miles long, more than fifteen feet high and nearly as thick! It was discovered near Milano, extending in a north-east and and south-west direction. The top-level of this immense and mysterious structure is some distance below the present surface, which is an accumulation of loam and such debris as natturally forms over old and neglected ruins. The finder informs his readers that the wall is in every way as well and solidly built as the great strucure in China, and proofs remain that it was flanked at equal distances, indicating that it was built by one people as a defense against another. This investigator also tells us that he has discovered at different places on parts of the wall situated over columns, inscriptions. But as the characters are in an unknown language, no one can at present know who built it. The writer doubts the authenticity of the above statement and gives it cum grano salis. If true more will be heard about it.

* * *

Relics Taken from an Ancient Tomb Recently Discover- in Washington.

Several quarts of Indian trinkets, arrows, and arrow heads, several weapons of bronze, and a heavy stone pot are now on their way to Chicago from Colville, Wash., near which place they were recently discovered in a mound. A Mr. J. A. Frisbie, who found the articles and who has sent them to the exposition, writes the following account of his adventure:

"The mound is situated in a small and perfectly level plain between a series of low, rolling hills. It rises to a height of thirty-five feet, and is turned at the top like the small end of an egg. It is seventy-six feet in circumference at the base, and slopes gradually to the apex. The material of which it is constructed is a mixture of hard iron clay, adobe, and shale.

"I obtained picks, shovels, a crowbar, drills, and some cartridges from a prospector. I also secured the services of two half-civilized Siwash bucks, and set to work on the east side of the pile. At first the Indians were slightly affected by a superstitious fear; but as the work progressed they began to share my enthusiasm and eagerness to reach the interior.

"After we had worked our way about 4 feet into the mound, making an excavation 4 feet by 6 feet high, we found the wall so hard that it was necessary to put in a blast. The charge was set, and three of us retreated to a safe distance to watch the result. Bang! went the blast, and fully one-third of the mound's wall was blown to fragments.

"The work of clearing away the debris consumed several hours, but when it was done I was well repaid for my labor and expense. The aperture disclosed a circular shaped chamber, the walls of which were smooth as glass and decorated with curious figures in vermillion red. Three human skeletens, partly covered with moldy skins of buffalo and bear, leaned in a squatting position against the wall on the west side, their faces turned to the east. The flesh that once covered these grayish-white bones had been long since turned to dust and the skins were so badly decayed that the slightest touch caused them to break into fragments. The skeleton in the center was by far the largest of the three, and by close examination I came to the conclusion that the trio must represent some great Indian chief and his two squaws.

"In front of the central figure stood a large earthern urn, or rather a pot, which was half filled with queer looking ornaments of various colored stones and arrow heads of bronze. There were also remains of three long bows, a leathern quiver filled with arrows, and a narrow-bladed tomahawk of bronze."

The above bronze (?) arrowheads were perhaps copper oxidized. They may have been iron which was turning into rust. At any rate there is every indication to believe that the mound was of modern origin and the idea of the writer, no doubt, is to exaggerate his find into one of great consequence.—Ed.

* * *

Antiquities of Platte County, Missouri.

Wm. M. Paxton, an attorney of Platte county, Mo., writes to a friend in Atchison about some interesting remains of a prehistoric race in that vicinity. Just below Parkville a number of mounds have been explored. They were found to contain flint implements, fragments of pottery and human bones, which were badly decayed and showed evidences of fire. In one mound a number of small stones used for grinding corn were found.

On Park college hill may be seen the remains of some large structure composed of sun dried brick. The brick are held together by straw, in the Egyptian style. A great many relics have been picked up in different parts of Platte county. Mr. Paxton is very much interested in archaeology in Platte county and he will probably make a thorough developement of the locality.

* * *

"Phœnix, A. T., Feb. 10.—Colonel Johnston, former editor of the Gazette, and William Condon, an experienced prospector, returned yesterday from the mountains, twenty-five miles northwest of this city, and report the discovery of the ruins of an old Aztec city, different from any before discoved. Among many hieroglyphics are drawings of men, and on an oval-shaped stone is a serpent, cross and anchor. Around these ruins is a stone wall or fortification in good state of preservation. The place indicates that there were at least 60,000 inhabitants. The country in the vicinity is mountainous and has been but little prospected."

Here we have another case of Munchausenism. These two men wish to turn into a city of Aztec origin of immense population, ruins of an old Pueblo village containing a few hundred souls. Their so-called serpent, cross, and anchor may be a rude Indian pictograph of a waving line, etc., having quite a different meaning from that above observed. Would that those who have the good fortune to stumble upon places of great interest honor themselves enough to be truthful when they describe their discoveries. —Ed.

* * *

There has been much speculation in regard to the origin. growth and decay of a race of people that existed in the Mississippi valley and its tributaries centuries before the white man discovered this continent. It is to be hoped that modern archæological research will solve the problem for all time as to whence they came and whither they went. The opinion prevails among many antiquarians that they have not "gone" yet; that in the American Indian we find the descendants of this once mighty people. By careful study and reflection we find few reasons to the contrary. Their rise, progress and decay is but an abridged history of the world. It is sufficient to point to the nations of the old world that have passed into history to show that it is ever thus.

The cause of this decline may never be known, but we believe that there will, in time, be no doubt as to the identity of the races.

It is a well known fact that since the advent of the white man earthern pottery, similar to that made by the mound builders, has been made by the Indians. The stone implements are very similar in construction. The custom of burying in mounds was practiced until quite recently by some of the Indian tribes, though the mounds are small when compared with the large ones found in the Ohio and Mississippi valleys; yet it required much labor to construct them.

The writer has had the privilege of opening a number of mounds in the vicinity of Manhattan, Kan. They are generally about eight feet in height, and from 30 to 50 feet in diamater at the base. In them, among the fragments of burned human bones, are found fragments of pottery, arrow and spear points, bone awles, bone and shell beads, scrapers, etc. In the neighborhood are found village sites in which implements similar in many respects are found.

One mound opened showed an intrusive burial; the bones were unburned but showed considerable age. The mound produced the usual amount of burned bones, arrow and spear heads.

Another mound produced, besides the burned bones, flint arrow points, bone heads, etc., a number of old-fashioned glass beads and a few other trinkets showing contact with the whites.

It may be interesting to know that the noted naturalist, Dr. Thomas Say, in company with a few men, visited the old Kaw Indian village, located two miles below where Manhattan now stands, in 1819.

The mode of burial practiced by this tribe was similar to that of the whites; graves were dug about four feet deep in the alluvial soil of the river bottoms. The burial mounds alluded to are all found on the tops of the high bluffs overlooking the rivers.

W. J. Griffing.

Manhattan, Kan.

* * *

A geological survey of Leavenworth county is being mads by Prof. Robert Hay, the well known geologist. On a bluff on the farm of Alexander Caldwell, just south of Leavenworth, he has discovered au ancient mound which he will shortly explore. The mound is said to be similar to those opened at Fort Leavenworth, and also the ones on Owl creek, just south of Atchison.

* * *

The Missing Link.

Prof. Virchow Says That It Is as Remote from Discovery as Ever.

[Lecture of Prof. Rudolph Virchow at Moscow.]

We know that man existed in the Quaternary epoch, that he lived through long ages, miserable and depressed, while stone, wood, horn and bone constituted the material of his arms and of his only instruments; we are convinced that a long interval separated the age of stone from the age of metals, and that only in particular place was the use of stone immediately replaced by that of metals. These are the data which now make part of the general knowledge acquired by civilized nations since the foundation of the Congress. But further studies respecting the origin and the regions whence the different branches of civilization have sprung have advanced relatively but very little. We seek in vain for the "missing link" connecting man with the monkey or any other animal species.

There exists a definite barrier separating man from the animal which has not yet been effaced—heredity, which transmits to children the faculties of their parents. We have never seen a monkey bring a man into the world, nor a man produce a monkey. All men having a simian appearance are simply pathological variants. It was generally believed a few years ago that there yet existed a few human races which still remained in the primitive inferior condition of their organization. But all these races have been objects of minute investigation, and we know that they have an organization like ours, often, indeed superior to that of supposed higher races; thus, the Eskimo head and the head of the Tierra del Fuegians belong to the perfected types. Some races have the same skulls very small, of about the same volume as the microcephalous skulls; for example, the inhabitants of the Andaman Islands and the Veddahs of Ceylon have been regarded as microcephalic. A more exact study has, however, shown a difference between them and the real microcephalic races. The head of an Andaman Islander or of a Veddah is very regular, only all its parts are a little smaller than among men of the ordinary races. Nanicephalic heads (dwarf), as I call them, have none of those characteristic anomalies that distinguish really microcepaalic heads. A single race, that of the Orang-Simaings and the Orang-Cekai of the peninsula of Malacca, still remains unstudied. The single traveler who has penetrated into the mountainous countries inhabited by them, the bold Russian, Miklukho Maklai, has ascertained that certain isolated individuals among Simaings are small and have curled hair. A new expedition has been sent into that country to study the anthropology of the Orang-Cekai; from which I have recently received a skull and few locks of hair; the stock is really a black race with curly hair, the brachycephalous head of which is distinguished by very moderate interior volume, but it does not offer the most trifling sign of bestial developement. Thus we are repulsed at every line of assault upon the human question. All the researches undertaken with the aim of finding continuity in progressive developement have been without result. There exists no proanthropos, no man-monkey, and the "connecting link" remains a phantom.

* * *

The excavations of 200 workmen under the direction of Dr. Chas. Waldstein, of the American School at Athens, have just revealed the foundation of the ancient temple of Hera, near Mycenæ. Aside from the discovery of the temple itself, many important and valuable works of ancient art have been unearthed.

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Will exchange 100 lbs. of gypsum, all fine specimens, for 100 lbs. of other minerals. Chas. Miller, Jr., 212 Jefferson St., Grand Rapids, Mich.

Stone spear and arrow points from the Rock River valley to exchange for those from other localities. Southern states preferred. -W. P. Clarke, Milton, Wis.

Kansas arrowheads and pieces of pottery for every archaeological paper sent me. Will give a dozen arrowheads for a copy of American Antiquarian. Geo. J. Remsburg, Atchison, Kan.

British stone implements: A complete set of drift and neolithic implements, forty specimens; three guineas. All genuine, warranted. G. F. Lawrence, Mem. Anth. Inst., 55 High St., Waudsworth, England. 11

I will exchange a good calvary saber and other war relics, fractional currency, several good old date U. S. cents, for good Indian, stone, or copper relics, or perfect mound pottery. Everybody answered. C. E. Tribbett, Thorntown, Indiana.

For Exchange.—Documents on Paleontology, Geology, Archaeology, Ethnology, Artic Regions, Surveys, etc., for similar publications. What have you? What do you want? Address, Book Exchange, Toledo, Ohio. Dealers in second-hand books, please send catalogues. tf

I would like to exchange Tennessee arrow heads and also Dana's Manual of Mineralogy for arrow heads from the following states: Minnesota, North and South Dakota, Wyoming, Arizona, Montana, California, Idaho, and Indian Territory. G. W. Racey, East Cumberland Gap, Tenn.

The Archæologist.

VOL. I. WATERLOO, INDIANA, JULY, 1893. NO. 7.

NOTES TAKEN IN DECEMBER, 1892, AND MARCH, 1893, AT THE QUATERNARY GRAVEL PITS OF ABBEVILLE, ST. ACHEUL AND CHELLES.

[BY HENRY C. MERCER.]

Crossing from the left to the right bank of the Somme at Abbeville, where the river is about one hundred feet wide, and passing up through the town itself, we reach on the hillside above, the open parade ground and meadow of the Champ de Mars.

Here about a mile from the bridge and forty meters above the stream, we stand upon the uppermost of the gravel terraces of Abbeville and close to the now filled pit of Moulin Quignon, where Boucher de Perthes in 1841 discovered the flint "implements" which have celebrated the spot throughout the world.

It is hard from thence to get a good view of the valley. The town itself conceals the lower terraces and we only realize that here where the river has eroded its way through the great secondary chalk formation of Northern France, a deposit of gravel has been washed up so high as to evidence an immense superiority in the ancient river level. This deposit, though several miles in length, does not, we learn, line the river throughout its entire course, but is only to be encountered at intervals, as at St. Acheul (eastern suburb of Amiens on left bank, up stream) at Montieres (western suburb of Amiens, left bank, down stream), at Longpre and Conde (left bank, about fifteen kilometers above Abbeville), and at several bends where the gravel, having been caught in quiet water, would most easily have resisted subsequent denundation.*

The two sand pits, "Carriere de Leon" and "Carriere de Chemin de Poste" on the Champ de Mars, and others nearer the river, which I examined in November, 1892, and again in March, 1893, gave a good idea of the uppermost of these gravel beds, which varied, I learned, in depth from six to seven meters.

Where the workmen digging for sand and road ballast, had exposed the stratum in clean cuts, I saw a mass of yellowish flint nodules, interlaid with beds of brown, red, yellow, and white sand. The flint masses, varying in diameter from two inches to two feet, save when broken, were always rounded. At first they looked like water-worn pebbles, but examination of the yellow chalky cement which encased them explained their smooth contours as the outlines of their original crystaline formation. Still the traces of water action were seen at once on looking at the lines of stratification, which in some places by their contortions evidenced the work of whirlpools;

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*In the opinion of French geologists there is no proof of direct glacial action traceable in these gravel deposits, though their fauna show evidence of the indirect effect of cold.

in others proved by series of regular parallel lines the quiet agency of even currents.

It was noticeable that the layers, owing to the presence of various oxides and particularly manganese, were brightly tinted in the shades of yellow, red, and brown, and that a large percentage of the nodules were broken, which in the upper layers the action of frost and weather would have fairly accounted for, since on examining the exposed and upper specimens we found that a multitude of them had already yielded to decomposition. The discolored lines upon their surface, well fringed with dendrites, marked planes of internal decay which had so weakened the masses that they fell at once into angular pieces on being struck a good blow.

On the other hand it was to be noted that none of the fragments examined and none of the nodules so fractured before my eyes showed that stamp of supposed human agency known as the bulb of percussion. Pieces so marked were not uncommon in the beds (I found several in place at the Carriere de Leon and one which I photographed in position at a depth of 1.50 metres in the Carriere de Chemin de Poste), but when discovered there, though no one has yet proved that anything but a blow will produce their typical conchoid, we need not insist on an artificial origin.

Strike one nodule with another and we notice that it flakes with extreme ease, and when we realize that the decomposition of certain spots in the underlying chalk (as at the Menchecourt quarry at Abbeville) is continually forming holes ("puits") into which the gravels have tumbled with more or less suddenness and force, that the same thing has happened again, where the gravel slopes have been "ravined" by down-washing rivulets, and that the original deposition of the beds must have been accompanied by some jostling of nodules, we are by no means ready to attribute each piece found with one, two, or even more conchoids to the hand of man.*

Luckily for the geologist and paleontologist, we soon learn that the gravels are rich in the bones of European quaternary mammals, that the fossils in the De Perthes Museum and Du Mesnil collection at Abbeville, and in the Saint Germain Museum came from them. But for the archæologist the great point that has made Abbeville and the Somme Valley the typical place of demonstration of man's great antiquity in Europe, is the fact that these gravels, according to the combined testimony of most European authorities, lie scattered from top to bottom with the pointed leaf shaped "implements" of flint that discovered here as stated by Boucher de Perthes in 1841 demonstrate that man dwelt on the banks of the Somme as the contemporary of the Ancient Elephant, Mammoth, Rhinoceros, Fossil Horse and Reindeer. My first effort in the course of several visits as I jumped into the pits, and closely scrutinized the banks, was to satisfy myself as far as possible from personal observation, that the bones and implements had in no way slipped down from the surface but were really found in positions proving that water had flowed and strata had been deposited over them, and as I passed from quarry to quarry and site to site, the testimony of circumstances, though I failed to find a single bone, or flint "implement" in place, was carefully noted.

As the pits were dug on comparatively level ground at a mile's distance from the river, and as the cuts were freshly made, showing all the lines of stratification, the talus difficulty encountered at the New Jersey bluff was as much escaped as it would be in the case of a well newly dug in the middle of Trenton. Let geologists visit the spot to satisfy themselves that the strata have not been redisposed or upset, though the point is not material if the beds are rich in fossils.

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*These are the important considerations which have impaired faith in the supposed human flakes, found in the tertiary gravels at Thenay. (See De Mortillet Musee Prehistorique. Plates 1, 2 and 3.

At the "Carriere de Leon" a workman showed M. du Mesnil and myself three typical leaf shaped specimens. as he said, recently found by him, one of which was covered with white patina, and three months later sold me a much decayed elephant's tooth at the quarry for two francs. Another laborer at the Carriere de Chemin de Poste sold me four chipped specimens, two patinated, for four francs and again three months later eight for five francs, found recently by him, as he said, in the "Limon Rouge," at spots indicated by him. At the "Carriere de Boulevard" at St. Acheul, a third sold me at least a dozen broken "axes" and chips, some of them well patinated, together with the bone of a Bos Primegenius, for four francs. (One of his "axes" he laid aside, saying that it was an imitation.) A fourth workman at Chelles sold me a similar collection together with three teeth of the Equus caballus for five francs, and there in the foreman's shed two large tables were piled with "axes" and the teeth and bones of the Rhinoceros Tichorinus, Elephas Primigenius, Equus Caballus, Bos Primigenius, and Reindeer, recently found, it was said, and refused sale by the gravel company.

As to forgeries I was put in the way of a just realization of the matter at the start. Unfortunately it is no difficult matter for anyone to pick up a nodule and flake it into the shape of a museum specimen, and, I learned from M. du Mesnil, that these productions of the modern workman were common at St. Acheul and Amiens, though not in Abbeville. Boucher de Perthes himself, it is said, was occasionally deceived by workmen, and there are several drawers full of fine specimens, both at St. Germain and in the collection of M. d'Ault du Mesnil at Abbeville, condemned as "frauds." Some have eccentric forms not unlike the snake shaped Mexican knives.

On the other hand many of the "axes" are well veined with dendrites, while others were, in a beautiful and striking way, colored with the white, yellow, purple and greenish patina, which I was informed, no art could adequately reproduce.*

So many of the specimens seen and bought by me were covered with this patina,† and their association with the fossils was so continual that I went away quite willing to believe that the "axes" were as genuine as the bones; that as the bones could not have slipped down from the surface, so the axes had not, and neither the extra testimony of the collection of M. du Mesnil nor that of the Museum of Boucher de Perthes seemed necessary to increase my faith that fossils and implemente were an integral part of of the gravels and had been deposited with them.

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*Notwithstanding the statement of M. Bertrand, (La Gaule avant les Gaulois p, 56.) the white patina can be and has been artificially produced. though it will not stand microscopic examination, for when false it is a superimposed crust, when true a decomposition of the surface. Very possibly red and other colors can be similarly imitated. Obviously it would be out of the place here to make known the forgers' formulae as detected by M. du Mesnil, and explained to me at Abbeville.

†From the color and texture of this encrustation M. d'Acy proposed to identify the stratum (at Chelles) in which the implements handed him by workmen have been found. But others think this is going too far as—certainly at Abbeville—the same colors occur in all the strata,

On the other hand, many implements considered genuine are not patinated at all. and after some examination I am unable to see how they are to be distinguished from forged specimens. If found by workmen however they might be ruled out altogether without depriving the evidence of much force.

In general, the appearance of all quarries were the same to an inexperienced eye. Over the top of all rested a superficial layer of vegetable mould, about two feet thick, often (as at Montieres) containing neolithic, bronze, and Roman remains, and below it, representing the last phenomenon of quaternary times, the "Limon Rouge," a band of sand and fractured nodules, one to two meters thick, reddened by atmospheric agencies and spread as if by a pasty down rolling of the whole slope's crust over all the terraces.

Where the terraces could be made out, geologists had generally conceded, after comparing their chemical constitution and fossil contents, that the highest were the oldest. But whatever the theory accepted as to the manner of their deposition and the cause of the floods which placed them, the chief means of distinguishing their relative age is not their position but the paleontological evidence and of the bones they contain; and no fact so distinguishes them from the fluvatile deposits in the eastern United States (as at Trenton) as the frequency of these fossils. Fortunate indeed is it for the European Archaeologist that, lying in thé midst of the chalk area which extends from the eastern coast of England to considerably beyond Paris, and formed of its washings, these interesting beds are everywhere well furnished with the lime necessary for the preservation of bones.

These fossils establish, according to the generally accepted opinion of French paleontologists that there is at Abbeville, an upper deposit or terrace oldest in time, a middle deposit, and a lower or latest deposit, marked by a successive change or evolution in the fauna.*

The upper terrace—say they—is noted for the predominance of the Elephas Antiquus, the appearance of the Rhinoceros Merkii, and the advent of man.

The middle terrace, which has considerably ravined the lower, is sub-divided into three parts,(a) the inferior representing a time of transition marked by the decadence and extinction of the Elephas Antiquus, and the appearance and increase of the Elephas Primigenius, (tusks narrowed together), (b) the intermediate, marking the time of greatest prevalence of the Elephas Primigenius, (with spreading tusks), and the frequency of the Rhinoceros Tichorhinus; (c) the superior representing an increase in the Elephas Primigenius. The lower division (not properly a terrace) namely the above mentioned "Limon Rouge" which covers the other terraces, is unstratified and much transformed by atmospheric agencies. It represents the age of the Reindeer and the extinction of the Elephas Primigenius.†

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*The UPPER TERRACE is now represented by the Carriere de Leon containing Eleph. Antiquus, Rhinoceros Merkii, Hippopotamus Major, Ursus Speleus, Megaceros, Hyena Spelea, Macherodus, Trogonterium.

The "Porte St. Gilles" quarry, containing E. Primigenius, Equus Caballus, Bos Primigenius, Rhinoceros Tichorinus; and the

"Chemin de Poste" quarry containing E. Primigenius, Bos Primigenius, Equus Caballus, Rhin. Tichorinus.

The MIDDLE TERRACE is represented by the Balastiere du Chemin de Fer quarry containing E. Antiquus and E, Primigenius together, Rhinocues Tichornius, Equus Caballus Cervus Elaphus, Bison Priscus, and the fauna of the Carrire Leon in changed relative proportion.

The LOWER TERRACE is represented by the Menchecourt quarry, containing Elephas Primigenius, Equus Caballus (Dominant), Rhinoceros Tichorinus (numerous), Reindeer, Cervus Elaphus, Cervus Terandus, Bos Primigenius, Ursus (not determined), and Syreno Fluminalis,

†The above data I owe to information kindly furnished me by M. G. d'Ault du Mesnil of Abbeville, At St. Acheul, the paleontology of the beds has not been carefully studied. The upper

There seems to be little difference of opinion among French paleontologists as to this sequence in the fauna, as proved by a study of all the beds at Abbeville (though Chelles and St. Acheul have not yet been sufficiently studied) and admitting the fact to be established, we next ask whether a corresponding sequence has been made out in the associated human "implements." Here students are at variance. French archaeologists prefer to hold that the aggregate of relics from the old beds differ in no respect in form or finish from those in the new, while paleontologists maintain that at Abbeville at least a step or two of advance in the art of stone chipping can be made out as we proceed from the most ancient to the newest terraces.

The question is of the highest importance. There are three well known forms of artificially flaked flints found at Abbeville (see Fig. 1, a, b, and c).* A, the rude point unknown among the Trenton specimens, of which only one end is specialized, the other being often left with its natural surface as if to be con-

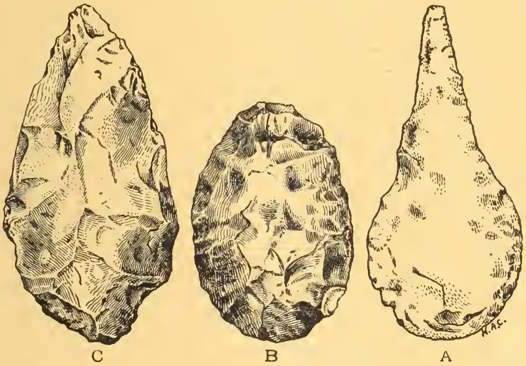

Fig. 1.

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terrace is represented by the gravel pits along the Boulevard St. Acheul. It was near here in pits since filled up that Dr, Rigollet after doubting the discoveries of Boucher de Perthes at Abbeville, was finally convinced by finding similar implements himself. The middle beds are not now exposed, but the lower and most recent are represented by the railway ballast quarry at Montieres one quarter mile from the river (left bank) and one mile below Amiens.

As the Abbeville and St. Acheul gravels are the work of the Somme, so the Chelles gravels are the work of the Marne At the station of Chelles—Garnay, (Dept. of Seine et Marne) on the right bank of the Marne about ten miles above its mouth in the Seine. the quarries and exposures are much larger than at Abbeville and Amiens. though the beds only average about six metres in depth. They lie not on the secondary chalk like the former, but on the tertiary beds of green marl (marne vert). Implements are continually found there by workmen as I saw at the quarry sheds. and it was because there the so-called "Mousterian" implements (flakes specialized on one side only) were not found associated with them as at St. Acheul. that M. de Mortillet gave up the term "Acheulleen" as used in France to describe Drift Implements (not Mousterian) and substituted "Chelleen."

The appearance of the Chelles gravels was quite different from that of the Abbeville and St. Acheul deposits. Here again was the "Limon Rouge" which had been spread it seemed, like thick pudding over the deposed strata, but the flint nodules were almost rare in comparison, and water worn pebbles. and boulders of sandstone and quartzite were quite frequent. The fossils largely duplicated those at Abbeville though the Equus Caballus was much more frequent. The problem of the relative age of the beds was more complex than on the Somme for while there the deposits were superposed in terraces, here they were placed side by side.

*d is the monsterian chip flaked on one side very rare at Chelles At Abbeville and Amiens it begins in the middle beds and continues increasing towards the top while a, b and c diminish. In the Boucher de Perthes Museum there are 205 specimens down stairs, three five inches long; very irregular in form, much nicked by use or weathered on edges.

e is the knife like flake, a companion of d, but only common in the upper beds, and the surface loam supposed to represent a still later stage of culture than d, called Magdalenian. In the De Perthes Museum there are about 230 specimens two to five inches long.

It is very interesting to note that M. du Munil has found several hammer stones, generally made of round flint nodules in the middle and upper beds at Abbeville, though never in the lower.

veniently grasped in the hand is found, it is said, from top to bottom of all the beds. In the Boucher de Perthes Museum (Rue Boucher de Perthes, Abbeville) there are 48 specimens of the form from Abbeville, of which 28 have the pebble surface remaining on the large end.

Form B resembling some of the American heavy cache blades, (see for instance the great cache referred to in Moorehead's "Primitive Man in Ohio") is a finer thinner blade specialized all round. It never occurs, we are told, in the oldest strata; but begins only as a companion to the Mammoth fossils.

Form C, the rough hewn model of B or A not specialized on its cutting edges, like A continues, it is said, from the bottom to the top of all the beds. To us it is of the greatest interest, since it alone and not A or B may be said to resemble, except in material, the specimens from Trenton and from the American jasper quarries and argillite workshops.*

The archaeologists contend that form B has been found in the oldest beds with the oldest bones, while their opponents allege that in such cases the top layers having been ,,ravined" by rivulets had tumbled to the bottom.

Recent American investigation throws some light on this interesting point, for if, as has been proved at Indian quarries in the District of Columbia. Arkansas; Ohio and Pennsylvania. the form C was continually made by the late North American Indian to be cast away as a "failure" or "waster" in the fashioning of his leaf shaped cache form,† (the duplicate of B) or his large spear, knife or scraper, then at or near the workshop where B was found‡ we would expect to find its forerunner, C, while if we admit that primitive man made the form B at, all we must agree that before he attained the skill ne-

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FORM A.

*In the Boucher de Perthes Museum (down stairs) there are 48 specimens of form A from Abbeville, all of which are unspecialized and very rude at one end, 28 retain the pebble surface at the base, and 29 are quite unmistakably specialized at the point. About 19 of the well specialized ones seem to show signs of use or water wear, the other 10 though equally specialized, look fresh and unused. About 18 look like rudely blocked out types of A.

In the British Museum there are 152 specimens of form A from all parts of South Britain, of them 96 are unmistakably specialized at the point while the base is very rough and generally retains the pebble or nodule surface. The remaining 56 are rude unspecialized forms of the same type.

FORM B.

Of form B there are 47 specimens in the Boucher de Perthes Museum (from Abbeville) from three to five inches long. well specialized all round, 11 of which seem to show signs of use or rolling. 5 little ones from two to two and one half inches long are also well specialized. In the British Museum there are only 30 British specimens of this form, which though specialized are much rougher than the French specimens.

FORM C.

There are 32 specimens of this form in the Boucher de Perthes Museum, rough, unspecialized, and indistinguishable in form from the Trenton specimens Of these about 14 look rolled or used. There are also about 5 little forms of the same pattern two to two and one half inches long. In the British Museum there are 97 British patterns of the type, of which W. G. Smith's specimen resting on the elephant bone (in the "Paleolithic floor" case,) is one. About 20 are made not of flint, but red quartzite.

Of all these specimens at Abbeville and London probably not 50 have a history. No account has been kept of the circumstances of discovery: the depth, the stratum, or the association with fossils. Most have certainly been obtained from workmen as I obtained mine. While at Abbeville all are alleged to have come from the gravels, at the British Museum some are allowed to have come from the surface.

This does not apply to M. d'Ault du Mesnil's collection, consisting of specimens found by himself with his own hands, though not photographed or recorded in place.

†For a study of the unfinished implements made by modern Indians at Piney Branch, Flint Ridge, Garland Co., Ark.. and in the Indian Territory. See the recent papers by W. H. Holmes. (In American Anthropologist and National Museum publications)

For a discussion of similar facts discovered at Durham, Saucon creek, Vera Cruz. and Macungie, in Eastern Pennsylvania, See M. S. reports for 1892 of the Department of Archæology of the University of Pennsylvania.

‡We may infer that on the Somme no special quarry was resorted to in quaternary times the mass of flint nodules in and on the chalk having constituted at all points a workshop for primitive man, even before the floods caught up and replaced the material.

cessary for it, he at one time would have halted at a still ruder pattern and, unable to proceed farther in the still experimental art, used it as a finished implement sufficient for his needs.

This granted we would not be surprised to find alone in the older beds, as a completed tool, the same form C, which higher up where more finished work was aimed at, would have been cast aside as a "waster" or "reject."*

Unfortunately is appeared that in the demonstration of these important points few exact records had been kept of the stratographic position of specimens discovered. None had been photographed in place, and not one in a hundred found by a scientific observer with his own hands. "We need," said M. Reinach at the museum of St. Germain, "a kind of hermit to live in the quarries and pounce upon the specimens as the workmen find them."

It is no new or surprising difficulty which confronts us when we come to the surface above these deposits, as at Abbeville at the Balastiere du Chemin de Fer, and at Montieres, on the plateau of the Vienne and at Chez Pourre, etc., and find there the typical "Hache" of the River Drift mixed with neolithic, bronze and Roman remains. This we must expect if successive peoples have occupied one and the same surfaces for long epochs. Yet while it is well to say that these superficial "axes" may have been or would have been dropped by older races at sites often occupied by later peoples, the question must be asked, What proof is there that the later peoples did not continue to make them? In America the alleged drift specimen has been reproduced continually by modern Indians. Has the same thing happened in Europe? Has neolithic man in the Old World too littered the ground with rejects that can not be distinguished from the Somme gravel forms, so that we may reasonably fear that the latter slipped down in some way from the surface?

The answers given in Europe to these questions, are,

1st. "The surface Drift forms are more deeply patinated than the arrowheads and celts that sometimes surround them." This I regard as of little weight. The white surface patina varies I believe with the composition of the stone and its position. The neolithic refuse at Spiennes is as white as the white "axes" from Abbeville.

2d. "The Drift forms have never been found in Neolithic interments as polished implements have never been found in the Drift."

3d. "Many of the European Drift forms are far too well finished to be classed as "rejects", and there is nothing like them at the Neolithic quarries." After visiting the quarry at Spiennes (near Mons Belgium) and there handling many specimens; there latter argument struck me as of great weight.

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*In America great stress is laid on the question whether the Trenton forms are or are not finished implements. Paleolithic Man in Europe made polished bone spear heads, realistic animal sketches superior to anything done in the Bronze age, and beautiful "Solutrian" blades nearly equal to Danish and California work If he produced "failures" and "rejects" in fashioning these latter, then we have an unfinished implement which is at the same time a "Paleolith."

A FEW INTERESTING FINDS IN THE COLUMBIAN GRAVELS.

[BY CHARLES LAUBACH, RIEGELSVILLE, PA.]

For a few miles back from the Delaware river, along the Durham valley, at Morgantown and vicinity, forty miles South of the terminal moraine in Bucks Co., Pa., there is a discontinuous patchy deposit of drift consisting in places only of scattering boulders and gravels of a few feet in depth in other places it consists of gravel, sand and clay from two to fifty feet deep. In some instances these gravels are covered with a deposit of brick clay, in wave-like layers of from two to sixteen feet in depth, the humous, or soil covering the clay and gravels, averaging from eight to twelve inches in thickness.

This deposit of drift, Columbian gravel, seems to have been deposited in this district without great abrasion of the rock surface, as no striae have been found on the rock exposures northward, in this vicinity.

In a well recently dug through the deposit of over forty feet in depth, sections through a black mucky clay and gravel have been met with, probably an earlier preglacial soil.

There is a possibilty that this earlier drift sheet embraces two distinct periods of deposition, as apparently a buried soil and deposit of limonite iron ore appears to border on this black mucky gravel deposit. That the valleys were formed previous to the deposition of these deposits there can be no doubt, as the drift is confined to an elevation of from 100 to 320 feet above tide throughout this valley; whereas, the South Mountains to the Northward and Southwest attain an elevation of from 500 to 900 feet above tide.

Surface boulders are apparently no more plentiful than in the body of the drift. The aspect of this gravel deposit is so different from the terminal moraine, and post glacial deposits along the Delaware river, that it can not be placed in the same geological record; but is without doubt the product of a distant invasion.

The Durham creek, running in a North-eastwardly direction to within a mile of the Deleware where it is deflected to an Easterly course by a bluff of secondary limestone, has cut through the Columbian gravels to a depth of at least sixty feet; while the Brandywine flowing in a South-easterly direction, emptying into Durham creek about a mile above its mouth, has eroded and cut through these gravels in many instances from ten to twenty or even more feet.

So far as we know our attitude in regard to the finds, hereinafter described, being in Columbian gravels, and not in post-glacial gravels may not be disputed, but we believe it best to indicate that in this section we have distinct evidence of two or more glacial invasions.

The very interesting archæological specimens in my possession were found in and on the surface of a deposit of Columbian gravel which is here overlaid by a deposit of brick clay. No. 1 is a finely carved specimen of limonite ore, having at one end a sort of knob into which is bored a hole three-sixteenths of an inch in width, and one-half inch deep, which may have served the purpose of an ornament by inserting into the perforation a hooked bone or stick. The specimen is one and three-quarters inches long.

No. 2 is a flat oblong boulder, with rounded corners having at one end a perforation. It measures two by three inches, and is three-quarters of an inch thick.

No. 3 is a round paleolithic implement three inches in diameter. It has a sharp edge all around and on one side in its centre is what may be termed a thumb-hole, one-half inch deep and one inch in diameter. It is made from a fine grained Potsdam sandstone.

No. 4 is a roughly-chipped oyster-shaped breast-plate worked out of coarse grained Potsdam sandstone three-quarters of an inch thick, three and four inches in short and long diameter.

No. 5 is a broken skinning knife worked out of Potsdam sandstone, one and one-half inches wide, and two and one-half inches long. It is polished on one side, rough on the other, and has an edged point.

No. 6 is a planing or smoothing implement with lower side polished by attrition, and upper side roughly chipped. One end is square the other rounded. It is carved out of a rough yellowish Potsdam sandstone, three and one-half inches long, one and one-half inches high and the same in width.

No. 7 is a very rude paleolith or "teashoa" with attempted perforation, the specimen evidently breaking before becoming finished. It is round at one end and almost square at the other. The attempt at perforation was made at one of the corners at the almost square end, It is made from a brittle, fine grained Potsdam sandstone and its size is one and one-half by two inches.

No. 8 is to me a new and unique implement. I have never seen one figured or described. It is made of black chert not found in any formation on this side of the Kittatinny mountains, and its geological position places it at an early epoch of primeval man's existence. It was found in brick clay overlaid by humous or soil of about eight inches. The specimen was taken from a depth of about 28 inches, and after close examination of the locality, we come to the conclusion that the implement was brought here by the same agency that transported the brick clay. This clay is underlaid by Columbian gravel to a varying depth of from two to eight feet; the brick clay varies from six to sixteen feet, and the soil is about eight or ten inches deep. The height above tide is 300 feet, and the elevation above the present level of the Delaware river 230 feet, and is distant from that stream about one mile.

The implement is large three by two inches, three-quarters of an inch thick, and of the "turtle back" shape and style of chipping. In spite of the fact that that able archæologist, W. H. Holmes, insists that such finds do not prove the existence of a glacial or post-glacial man, because these rude objects may have passed from the surface down into the ground through some other, cause, especially the burrowing of animals. I am forced to believe that the implement was made by a being of human form far down in the scale of civilization, and who lived in an age measured or counted by thousands of years, and when the Delaware river flowed above its present level several hundred feet.

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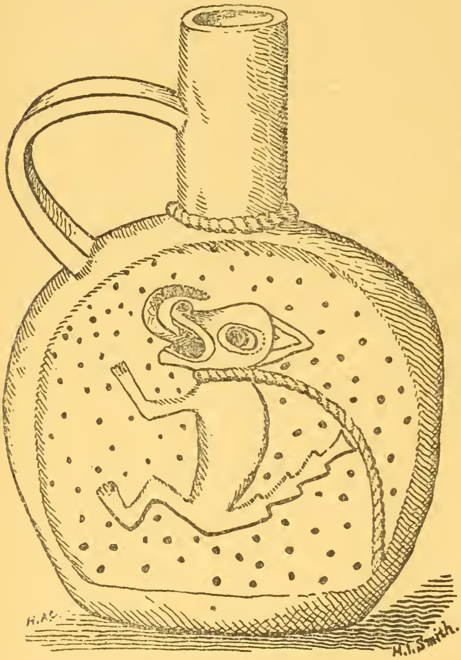
A remarkable series of Roman iron tools, over 60 in number, were discovered in a rubbish pit during excavations at Silchester in 1890. Among the tools are anvils, hammers, chisels, gauges, adzes, axes and a carpenter's plane, the only one yet found in Britain. The find also included two plow coulters, a sword blade, a large gridiron, a lamp, and a bronze steelyard.

AN ANCIENT PERUVIAN WATER JUG.

[BY HARLAN I. SMITH, SAGINAW, (E. S.) MICH.]

Among the many interesting specimens of ancient Peruvian art collected by the Beal-Steere expedition, to South America between the years 1872 and 1875, is a most peculiar water jug. This vessel was obtained from one of the wealthy families living near the western coast of Peru in the vicinity of Pacasmayo. The specimen is one of a series of several hundred Peruvian pottery vessels now on exhibition in the archæological section of the museum at the University of Michigan. The entire series was collected by the expedition previously mentioned, and includes the finest specimens of South American pottery which were secured during its trip up the Amazon and over the Andes.



Although the party was out principally for zoological work, much was done in the lines of geology, archæology and botany.

The jug is somewhat in the shape of a flask, and the material is of a coal-black earthenware.

The illustration gives a better idea of the general form and ornamentation than could be obtained from a written description. The meaning conveyed by the figuration on it is a matter of conjecture: possibly it was to represent some supernatural being, and had a bearing upon the religion of the ancient Peruvians: or perhaps it is an exaggerated representation of a monkey-like animal, kept captive to be used in the various ceremonies in which it was their custom to participate. One of the peculiar points of the figure that will be noticed in the illustration, is the diagramatic tail, which on the reverse side of the vessel is perfectly natural, although the remainder of the figure is exactly like the illustrated side, not only in shape but also in dimensions. The figures which are in relief, have suffered little or no wear in the many years that have elapsed since they were first outlined upon the vessel.

It is the supposition that this flask was a water jug and was carried at the side, suspended by means of the handle from the waist, in a manner similar to that which is practiced at the present day in the same locality.

AS TO THE "EXTINCTION" OF THE AMERICAN HORSE.

An article signed by Robert C. Auld, under the above heading, appeared in Science, Sept. 2, 1892, and is so interesting that I quote it in full: "In 1881 in the Kansas City Review, E. L. Berthoud pointed out the fact that in maps drawn up by Sebastian Cabot (who went in 1527 to the east of South America), to show his discoveries, at the head of the LaPlata, with figures of other animals he gives that of the horse. This fact, as thus put on such indubitable record, is accepted by scientists, including Heilprin, Wilckins and Flower.—The latter, in his manual on 'The Horse' (1891) says, 'The usual statement as to the complete extinction of the horse in America is thus qualified, as there is a posibility of the animals having still existed, in a wild state, in some parts of the continent remote from that which was first visited by the Spaniards, when they were certainly unknown. It has been suggested that the horses which were found by Cabot in LaPlata in 1530 cannot have been introduced.

The above is surely of great interest, and is worthy of repetition. The writer has come across two statements, which, when taken in connection with the above, appears to be even more important and significant, and may profitably be given wider prominence. As they are not generally known, they are given for the purpose of receiving the attention that they seem to deserve.

In the volume of the Naturalists Library, entitled, 'The Horse,' by Major Hamilton Smith, published in London in 1841, appears the following: 'Several recent travelers in the northern portion of that continent (America) question the race of horses now so abundant being imported subsequent to the discovery by Columbus' (p. 14).

In "The History and Delineation of the Horse", by the noted authority, John Lawrence, published in London in 1809, the following sentence occurs: 'The non-existence of the horse in America previous to its discovery by Europeans has, however, been disputed; but I recollect not by whom, or upon what grounds' (p. 7). (Signed:) Robt. C. Auld.

Recently in writing the traditions of the Klickitats, a race of "horse Indians" residing in the Yakenia valley, Washington, on the Upper Columbia, the Indian related some very interesting stories concerning the spotted horse, or "pinto", and the black horse. They related to mythical journeys of ancient Klickitats to a land across the Pacific—"Haik Whulge", to the land where the sun sets, and he assured me earnestly that the Klickitats had always had the horse called the "cayuse". Many of the traditions relate to the "cayuse", and the very oldest Indians tell that they got the horse from the west—across the ocean.

When Lewis and Clarke came into the Columbia basin in 1805, they found the Indians in possession of great herds of these "cayuse" ponies, which at that time represented the wealth of the owners. We know as a historical fact that they did not come from California; and from the character of the animal it is asserted that they are not the offspring of the Spanish stock, but really constitute a Columbia river basin type of the Mongolian pony! A gentleman recently from Mongolia who is perfectly familiar with both horses, assures me that the "cayuse" is the exact counterpart of the Mongolian pony, spots and all.

If, now, the Mongolian tribes of Asia, really spread out over the American continent from the Columbia basin, it is improbable that a pair of these Mongol ponies may not also have reached this region, and that this peculiar type of the horse species is descended therefrom? It is asserted that the 'cayuse" constitutes a distinct race or type; that it is unlike any other horse, except the Mongolian; that it existed in the Columbia basin in great herds when the first white man came into that region; that by Indian testimony and tradition it had existed then for ages before; that it did not come from California.

Where did the type come from?

In "Fu-Sang," or the story of the discovery of America by the Chinese monk, Hoe-Shin, in 499 A. D., we are told that the people in the region visited by Hoe-Shin had the horse. The region of Fu-Sang is fixed at about the Columbia basin, although the monk went as far south, possibly, as California or Mexico. If, now, this Buddhist priest told the truth, and the Columbia valley is Fu-Sang, he certainly saw the horse there in 499 A. D., which antedates the Spaniards a thousand years.

Volumes have been written by scientists and scholars to prove the monks story to be true: they equally prove that the "cayuse" pony of the Columbia is either a native or an emigrant from Mongolia!

I recently called the attention of the Smithsonian to this matter, and was informed that the only book that contends for the Pre-Columbian horse in America is the Mormon bible. How far the Mormon bible may be relied upon by some scientists for ethnological information I cannot tell, but I do insist that there is too much in the question of the origin of the "cayuse" horse of the Columbia to get rid of it in that way. Fu-Sang, the alleged Chinese discovery is honestly and earnestly discussed by the most eminent historians of the age, and many respectable authorities admit its authenticity; many more highly respected authorities admit that the aboriginal races of America came from Asia by way of the Aleutian islands. Among which authorities we find no less great names than Humboldt, Winchell. Bryant and Justu Winsor.

Why then be surprised if the Mongolian horse is also found with his old Mongolian master in the ranges of the Columbia basin?

Tacoma, Washington. James Wickersham.

◆

BRITISH STONE CIRCLES.—STONEHENGE.

[BY A. L. LEWIS, LONDON, ENGLAND.]

If the circles at Abury (or Avebury) claim the first notice on account of their great superiority in size above all others, Stonehenge naturally, and for many reasons, takes the next place to them. Stonehenge is eighteen miles south of Abury: the nearest town to it is Amesbury (three miles), but as Amesbury is not on any line of railway, Salisbury (Great Western or South Western railways) is the most convenient place from which to visit it; the distance is eight miles, six by road and two across the plain after leaving the road, and there is now no refreshment house on the way. The British entrenched hill, on which the Roman, Saxon, and Norman city stood. and which, under the title of old Sarum, returned representatives to Parliament till 1832, at which time it was uninhabited, will attract notice, and may be visited either in going or returning.

The outer circle at Stonehenge is 100 feet in diameter, and if it were ever completed (which is a point in dispute) consisted of 30 stones, averaging 13½ feet in height; they were roughly squared and had two knobs or bosses worked on the top of each, and they were connected by smaller stones. each of which had a hole at each end, made to fit on the knobs of the upright stones on which it rested; these arrangements are found in no other circle, and are of themselves sufficient to render Stonehenge perfectly unique. One stone of this circle, still standing in its place, is shorter and slighter than the others, and this has led to doubts as to whether the outer circle was ever complete. Inside the outer circle were, first, a circle of small stones, the original number of which is uncertain, and, second, inside these five trilithons or groups of three stones, two upright and one connecting their tops, these capstones, like those of the outer circle, were kept in their places by holes fitting on knobs cut on the tops of the uprights, but while each upright of the outer circle had two knobs, and the chain of capstones was continuous, the uprights of the trilithons had but one knob each, and each pair of uprights with its capstone was separate from its neighbor; these trilithons were arranged in the form of a horseshoe, the highest (of which the uprights were 22 feet above ground) being in the centre, and the opening of the horseshoe, which is 44 feet wide, being toward the northeast. Inside this horseshoe of trilithons was a horse-shoe of smaller stones, originally perhaps 19 in number, and from 6 to 9 ft. high, the highest being in the middle, and inside these, and in front of the highest trilithon, is a flat stone, about 17 feet long and 3 wide, which is commonly called the alter stone, though, if sacrafices were ever offered there it would have been much more convenient to have had a smaller but higher alter standing upon this slab. There is a small stone lying inside the small inner horseshoe, which has two hollows and seems therefore to have been intended to rest upon two small upright stones, but no stones suitable for its support now exist, and it is possible that this stone may have stood on two small stones on the slab already mentioned, and may have been the actual altar. It has, however, been thought that it was the capstone of a small trilithon which stood in the middle of the open side of the horshshoe formed by the large trilithons, but there is no evidence as to its original position or use or as to the former existence of any small trilithon.

The smaller stones or bluestones as they are called were brought from a great distance—Devonshire, Wales, or Ireland—but the larger stones forming the outer circle and the great trilithons were obtained from the surrounding plain. Nine of the inner bluestones and nineteen of the outer ones remain, some standing and some fallen; twenty-four of the stones of the outer circle are represented by standing or fallen stones (including fragments), and six of its lintels or cross-stones are still in position; of the trilithons two are complete and the other three are more or less ruined, though all the stones of which they consisted are there, some broken, some entire.

The circles are surrounded by a slight ditch and bank, 300 feet in diameter, from which an avenue defined by earthern banks leads in a northeasterly direction for about 1800 feet, when it divides into two branches, the most northerly of which leads toward a space enclosed by earthern banks and called by Stukeley the "Cursus." Just inside the ditch and bank are two barrows, on opposite sides of the circles, and so placed that a line from one to the other passes through the centre of the circles. There are also two single stones near the inner circumference of the ditch placed like the barrows on opposite sides of the circles and so that a line from one to the other passes through the centre of the circles. At the point where the avenue joins the ditch there is a large stone lying flat, and nearly 100 feet along the avenue stands a rough stone, called the "Friar's Heel," in such a position that anyone standing on the flat stone called the "altar," already mentioned, may see the sun rise over its tip, or nearly so, on Midsummer morning, a fact which is generally verified by several people every year. It has been said that the flat stone between the Friar's Heel and the circles formerly stood upright, and hid the former from the latter, and that the coincidence as to the sunrise was therefore not intentional: but if the flat stone ever were upright the sun would have appeared to rise over it, and if neither stone existed the whole arrangement of the circles and avenue would still direct attention to the northeast or midsummer sunrise quarter.

Stonehenge has been attributed to various peoples, ranging from Atlanteans of 10,000 B. C., to Danes of the ninth century of our era, and numerous suggestions have been made as to its object. Two or three archæologists of late years have endeavored to show that it is merely the skeleton of a vast tower of dry or uncemented masonry, and the visitor must form his own idea as to the probability of this view. Burials would seem to have taken place in the centre, as bones and iron armor were dug up there in 1620, but this does not show that burial was the only or even the chief object for which the circles were constructed. Perhaps the view that best fits all the facts is that a circle or circles with avenue and outlying stones so arranged as to make it suitable for sun-worship existed here in very early times and that long afterwards, in the dark period between the Roman rule and the Saxon domination, certain murdered Britons were buried in the circles, which were restored and re-arranged as a monument to their memory. Stonehenge, while it has much in common with the other British circles, has also so many points of difference from them, that it seems as though it must have had a special history of its own.—SCIENCE, Vol. XXI, No. 537, pp. 274—5, May 19, 1893.

REVIEW.—Are the Maya Hieroglyphs Phonetic?

[BY CYRUS THOMAS.]

This article, which will appear in the American Anthropologist for July, 1893, covering twenty-nine pages, is a most valuable and interesting paper on the subject. The author has, for a number of years, been a diligent student of the Maya glyphics, on which he has spent much time, and in this paper attempts to show his readers that the characters are nearly all phonetic. With him agree such able linguists as the Frenchmen, H. de Charency and Leon de Rosny. Other students like Drs. Forstman. Shellhas, and Seler, while they agree that they represent ideas may yet contain a few signs which can be sounded. Professors Holden and Valentini question the existence of any such elements that may be phonetic. Another able Americanist and linguist who is Dr. D. G. Brinton tells us that the script while it is certainly phonetic, becomes more of the nature of a rebus, and should be read in rebus-like manner.

Ramirez and Arozco, two Mexican antiquarians, are also doing much work on these mysterious figures.

Although so much has been written on the subject the results obtained have been far from satisfactory, and says Dr. Brinton "the threshhold of investigation has even not yet been passed". Dr. Thomas, however, in closing his paper, expresses the hope that students will use "as a basis for further efforts in the same direction" what is presented in his work, and he further writes: "Though a considerable portion of my interpretations may not sustain the text of rigorous examination or the results of future discoveries, yet I feel assured that further investigation and study will show that I am moving in the proper direction, and that light is at last breaking in upon these mysterious records." 'Tis a pity that another "Rosetta stone" can not be found to explain the mystery still surrounding this strange system.

A. F. BERLIN.

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EDITORIAL.

The Viking Ship.

The Viking vessel, an exact reproduction of an old Norse boat discovered in a mound in 1880 at Gokstad in Norway has at last reached our shores. The bold seamen who undertook this venturesome voyage are receiving ovations wherever they go. It is extremely pleasant to note this fact, for they are descendants of the daring Norsemen who discovered our Continent hundreds of years before the Geonese mariner was born. Nor is it right that he alone should receive the honors which in this year of our Lord 1893 are accorded him. Although he is certainly worthy of part of it, taking into consideration his troubles. It is said that Columbus obtained his information respecting the New World from the old Norse sagas. Whether true or not the writer is at present not prepared to say.

At any rate this venture proves that a trip like this could be made with safety in a small vessel.

We know that the Vikings were daring sea-rovers, and many of their sagas tell of the discovery beyond the great waters by them of countries far away from their homes.

A legend dating back to the sixth century tells us of the retreat on the island of St. Brandon, which was situated in the ocean toward the west, of an Irish hermit, and again in another story of the flight in the eighth century of the christians of Gothic Spain toward the "Seven Islands" when it passed into the hands of the Saracens.

A wonderful story is the legend of the lost "Atlantis," an island equal in size to a continent, lying in the Atlantic ocean westward from Europe and Africa. This island the seat of a powerful empire, was destroyed by a terrible convulsion of nature. Several writers appear to think that it was an extention of the peninsula of Yucatan which then extended near to the Old World.

Was it over this now submerged land that came the people who built the almost buried and mysterious cities of Mexico and Central America, and were these unknown people the discoverers of America?

The Phœnicians undoubtedly, for they were a powerful maratime race, ventured far westward on the Atlantic ocean, and in one of these voyages one of their ships may have landed on what are now American shores.

The Chinese and Japanese too appear to have discovered the new Continents ages ago: for they knew of it in the fifth century of our Era, and named it Fusang. On the northern coast of Peru stands a small village called Eten. Its inhabitants speak a language which their neighbors do not understand; but the Chinese have no trouble in conversing with them.

In ancient times the Malay empire extended, it is said, its sway over nearly all the islands of the Pacific ocean.

Some of their vessels may have drifted on South American Shores.

The Welsh prince Madoc or Madawc, so the legend says, set sail into the then unknown West in 1170, reaching the New World where he settled, returning afterward for more colonists to join his people. This brings to the mind of the writer the story of the Welsh Indians found in North Carolina with the Tuscaroras, by the Rev. Morgan Jones, who swore that he could converse in Welsh with them.

The artist Catlin will have us believe that it has been clearly proven that the Welsh prince with his followers landed either on the coast of Florida, or about the mouth of the Mississippi going up this river and settling somewhere in the interior of North America, and suggests that the practically extinct Mandan tribe of Indians were possibly the remains of this lost colony which had amalgamated with some Indian tribe. It appears too, and it is a fact worthy of notice, that a Scotsman came to America before the visit of Columbus. Thorfirm Karlsefne, who came to Nova Scotia in 1007, had for a fellow voyager a Scot! With this man came also a woman of the same nation named Hekia. It is supposed they were captured and carried off as slaves by the Vikings on a marauding expedition to that part of Great Britain.

There is a strong belief that the Norsemen landed somewhere in New England with the intention of forming a permanent settlement, and through an old Norse saga Prof. Horsford, of Cambridge, Mass., undertook to search for this settlement. To his satisfaction he located near his own home at Watertown, on the Charles river, the site on which he caused to be placed a memorial tower and an inscribed tablet, and named is Nurembega. Like Columbus and his men the Vikings seem to have had considerable trouble with the aborigines who they called "skroelings," meaning dwarfs. Whether the "skroeling" were Esquimo or the red Indians has not yet been determined. If they were Esquimo who are of small stature then our aborigines must have been recent intruders. A number of the Norsemen were at various times killed by these savage people, and their continued hostile feeling ended the enterprise to found colonies on the North American continent. Thus ended an undertaking which, had it been successful, would have changed considerably the history of our New World. A. F. BERLIN.

CORRESPONDENCE.

ED. ARCHÆOLOGIST:

I like THE ARCHÆOLOGIST more and more; all "meat" and no "gristle". You ought to have a big list of subscribers.

In June number I see you publish under title of "The Missing Link", a report of lecture by Virchow. Would it not be well to call attention to article on "Man's Origin", by Prof. E. D. Cope, in Naturalist of May, '93? He takes an opposite view and not without abundant good reason. Happily there are a few workers—not mere theorists—who do not take a pessimistic view of these questions; but believe that already a good deal has been accomplished towards settling them.

If, as your journal is devoted so largely to American matters, the full fledged jasper Indian is and always was America's only occupant, why do you not call the periodical the "Indianologist"? Mr. Peet is right in saying it will be clearer after the storm, and I look for the unquestioned establishment of the fact, that the original occupant of this country was more of the savage than at the time of the Columbian discovery, and the date of his arrival was a few thousand and not a few hundred years ago.

Yours truly, CHARLES C. ABBOTT,

Curator Museum of American Archæology, University of Pennsylvania.

NOTES.

Mrs. Schlieman wife of Dr. Henry Schlieman, the celebrated explorer, archæologist and author, will present a portion of the antiquities unearthed by her husband in the Hill of Hissarlik, the Acropolis of the Greek Ilium, to the United States National Museum at Washington, D. C.

* * *

The Ancient Betrothal Ring.

The ancients wore the betrothal ring, as now, on the next least finger of the left hand. Many reasons are assigned for this, as the erroneous idea that a vein or nerve went direct to the heart, and therefore the outward sign of matrimony should be placed in connection with the seat of life; the left hand is a sign of inferiority or subjection; the left hand is less employed than the right, and the finger next least the best protected. At one time it was the custom to place the wedding ring on the right hand of the bride. The Anglo-Saxon bridegroom at the betrothal gave a wed or pledge, and a ring was placed on the maiden's right hand, where it remained till marriage and was then transferred to the left.

* * *

Edward Morris Brigham, a South American explorer, set sail from New York on April 30 for his fourth expedition to the American tropics. The journey will begin in southern Peru and extend through Bolivia into northern Peru, thence across the three ranges of the Andes to the head waters of the Amazon. The first navigable water reached will be the river Huallage, a southern tributary of the Amazon. The explorer will make his way down this river in canoes, and thence down the Amazon in canoes and steamboats to the Atlantic. The object of the expedition is archæological and ethnological research. An effort will be made to discover the extent of territory occupied by an extinct people that Mr. Brigham has named Camutids, and whose remarkable remains and works of art he discovered while making excavations in the lower Amazon region in the interest of the Smithsonian Institution.

* * *

The collection of prehistoric relics belonging to Thomas Harper, of Allegheny, was yesterday taken from his home and placed in the Carnegie library. This was done by an agreement Allegheny city councils had made with Mr. Harper, by which the public would have the benefit of the collection. The aggregation of old stones and other curious things of times of long ago is one of the most interesting and valuable in the country. Most of the collection has been picked from the mounds of Illinois and Ohio and graveyards of Mexico and Central America, while a large number of the relics are from distant parts of the world.

* * *

The work of removing the old Indian mound in Walnut grove, Martin's Ferry, goes on slowly owing to the care exercised that none of the interesting relics to be found in it be lost. Recently a reporter was present while the work was going on, but no object of special interest was found. Just about 4 o'clock a lot of rotton wood was unearthed. Whether it was a box or only a piece of a log could not be told. Probably the most interesting article taken from the mound is a huge skull, which would seem to indicate that in the days of the mound builders there were giants abroad. This skull is at least twice as large as the normal average of today. This skull is in a good state of preservation. In the collection of relics exhibited in the same place are the cuplike stones, which have been supposed to be cups made by ancient inhabitants. Whether these were made by man or are stones in the process of formation, the outer shell only having become petrified, it would take an expert to decide. Certain it is, however, that similar cups are frequently found in this vicinity in the ground or on its surface, having the appearance of being a natural product and not an artificial one. Some of the spearheads and hatchets found at Martin's Ferry are as perfect as any ever found anywhere. Bones are found in every part of the mound bearing out the theory that such mounds were simply cemeteries instead of the graves and monuments at once of great chiefs. Several corpses have certainly been buried in this mound. The finding of curious precious stones is worthy of notice. What seems to be opals, emeralds and crystals nearly like diamonds have been taken from the mound. Learned savants have held that the proof is complete, from the articles found at Moundsville, W. V., that moundbuilders were Croations or Phœnicians or both. The presence of precious stones in the vicinity of these corpses, with flint darts, spearheads, stone axes and stones with holes neatly drilled in them, may furnish another clew to the identity of the lost race. The mound at Moundsville is the highest mound found in this part of the country, it being over 100 feet high.

* * *

That portion of the Kaw valley extending into Riley and Cloud counties, Kansas, is especially rich in the remains of a former nation showing some signs of civilization. There are numerous mounds extending along the river at regular intervals, proving that at some time a numerous people dwelt in that section. Several of these mounds have been opened, and in them have been found an excellent quality of pottery and bone instruments of a make and finish far superior to anything in the possession of the Indians of a later day.

C. S. Mason, of Manhattan, opened two of the bottom mounds on the farm of L. M. Trowbridge, near the town of Merideth, in Cloud county, making some interesting discoveries, at least interesting to the student of antiquities. At the depth of eight inches a layer of burned clay from three to eight inches thick was discovered. This clay, which covered a space of about 10 square yards, had marks of grass and sticks imprinted upon it, and in many places were holes evidently made by stakes. Careful investigation failed to reveal any clay in the immediate neighborhood, so that it is believed that it was carried here from some distance.

Underneath this layer of clay was a very smooth and carefully perpared pit, the inner surface of which was very hard and solid. It had evidently been under the action of fire, being of a dull reddish color. This pit contained a large quantity of pure wood ashes, which had become very compact. Near the top of the pit was found a fragment of deer horn, which had apparently been sawed off with a rough flint. Broken pottery and bones were scattered about for a space of 20 feet, the bones being those of birds and animals. Some of the pieces of bones showed by their smooth surfaces that they had been used as implements of some kind, either as knives or scrapers. An arrow point, a bone needle, several of the spoon-shaped flints so common in such places, and a number of whetstones were also found.

The second mound, about 60 yards

distant, had a larger ashpit, but no mud wall. The pottery fragments were more numerous and of a greater variety. The fragments of a large pottery vessel held together by a buffalo bone were found. Six feet from the pit was a large sandstone slab having a smoothly worn depression on one side, which had evidently been used for a mortar. On removing this slab a single grain of charred corn, which crumbled instantly on being exposed to the air, was found. An arrow point discovered at this place is different from any before found in the bottom mounds.

Among the relics found at various times is a fine pipe made of red pipestone, which has been deposited in the State Historical Society. Nearly all the pottery found shows rude attempts at ornamentation, principally in lines and circles.

* * *

Antiquity of the Wheelbarrow.

The invention of the wheelbarrow has been generally ascribed to Blaise Pascal, who lived about the middle of the seventeenth century. M. Littre, in his Dictionary, attributes it to one Sieur Dupin, in 1669, seven years after Pascal's death. M. Gaston Tissandier however, found in a copy of the Cosmography of Sebastian Munster, 1555, a curious woodcut representing a wheelbarrow pushed by a workman. Another plate in the same book shows a tramway wagon running on rails. Still earlier evidences of the existence of the wheelbarrow have been found by M. Bixio and M. F. Guerrero, who organized the retrospective exposition of the means of transportation, which was held at Paris in 1889. A manuscript history of the sangreal of the thirteenth century contains a picture of one man shoving another in a wheelbarrow of a style now in general use. A manuscript—Vita et Passio S. Dionysii Areopagi—of the fourteenth century, has a representation of a wheelbarrow of another model, which is used in carrying a bundle. A very artistic picture in a manuscript—La Vie et les Miracles de Notre Dame—of the fourteenth century, represents a hospital where Sisters are taking care of wounded, lame, deformed, or paralytic persons, to which a man is wheeling a new patient. A miniature in an illustrated edition of Quintus Curtius, of the fourteenth century, shows a workman wheeling building material, who is assisted in sustaining his load by a strap over his shoulders. These evidences testify to the use of the wheelbarrow as early as the thirteenth century, and it may have been an old invention then.—Popular Science Monthly.

* * *

The New Stone Age in Iceland.

According to a lecture before the English Society of Arts on Iceland, by Dr. Tempest Anderson, in the more remote parts of the country, such as Skaptadals, many articles of stone and bone are still in use which in more accessible districts have been replaced by metal or earthenware. A photograph exhibited showed a wheelbarrow with a stone wheel, a steelyard with a stone weight, a hammer with a stone head, and a net with bone sinkers. At the same farm a quern, or stone hand-mill, was in use, and also horn stirrups, and harness fastenings of bone instead of metallic buckles, bone pins, and rude bone dice. At a neighboring farm was a basin formed of a cup joint of a basalt pillar. Truly we still have a survival of the stone age. Less remote than this is the meeting-place of the county council of the district in a spacious cave in the lava. It would be difficult to find anything more appropriate in such a primitive land. Mr. E. Magnusson, speaking on the author's address, said that in some places the people, though descended from those who had long left the stone age behind, had found it necessary, because it was so difficult to procure iron, to create a new stone age for themselves. They were the creators of a new stone age, not the followers of a tradition.

* * *

Thirteen years ago was exhumed from a mound near Sandefjord, Norway, the remains of an old Viking ship, and what there is of it now rests in the University of Norway. A correct copy of this vessel is at present (May 6th) ploughing westward the Atlantic and is expected to reach the Columbian Fair next month.

* * *

One of the most interesting discoveries in the history of American archæology has been made in Wyoming. A party of prospectors just in from the north report finding an extensive Indian arrowhead mine located in the foot-hills, about 40 miles east of Laramie Peak, on the headwaters of the Muddy. The remains of a large Indian village were also discovered on the mesa in its immediate vicinity. The site of this village, which is shown by hundreds of tepee beds, is strewn with broken fragments of arrowheads, lanceheads, stone axes, etc.

The rock mined is an agate of varied colors, milk-white predominating. It breaks with sharp edges. Along veins of this rock, lying beneath limestone, long tunnels have been run and many open cuts made. One of the shafts, partially filled with the drift of time, had a large tree growing in its center.

As estimated by the practical miners who examined the workings it would take 100 men two years to do the work by modern methods. Scientific parties are arranging to visit the place, and will make maps and detailed reports on this curious revelation of a barbaric age.

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The Archæologist.

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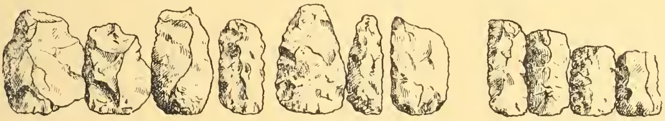
NOTES TAKEN IN DECEMBER, 1892, AND MARCH, 1893, AT THE QUATERNARY GRAVEL PITS OF ABBEVILLE, ST. ACHEUL, AND CHELLES.

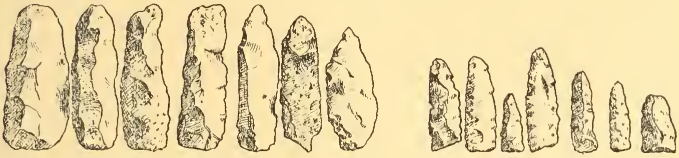
(CONTINUED.)

[BY HENRY C. MERCER, DOYLESTON, PA.]

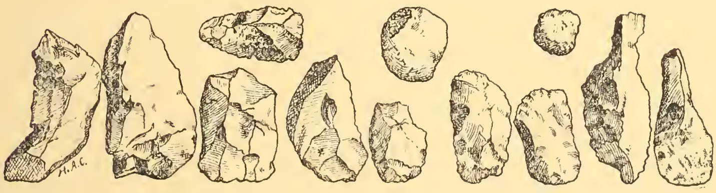
At Spiennes, the railway (from Framieres to Chimay) where it crosses the Trouille, cuts through a chalk hill honey-combed with ancient shafts thirty and forty feet deep by about six feet in diameter; at the bottom of which smaller burrows run into the flint layers in several directions. And it was in one of these shafts in 1867 that M. Cornet found the fire site and potsherds that it is allowed proved the quarries to have been the work of "Neolithic" not "Paleolithic" Man.



Tending towards B. B.



Tending towards A. A.



C:—*Hammer stones and inchoate forms. Intent indistinguishable.*

FIG. 2.

Series of partly specialized blades, blocked out and inchoate forms, and hammer stones from the Neolithic flint quarry and workshop at Spiennes, Belgium, gathered March 22 and 23, 1893.

The shafts now obscured by talus. were found filled with chalk blocks, flint fragments, chips, and rudely worked forms (Fig. 2), and some of the burrows contained stag-horn pick-axes, such as Canon Greenwell unearthed in considerable numbers at the similar quarry of "Grimes' Graves" near Brandon, Suffolk, England. The surface of the hillside in spite of the visits of collectors, is still thickly bedded with quarry workshop refuse, a fair series of which gathered by me in March, 1893, from the worked area, and from piles of "pieces tailles" in adjoining peasant's gardens, is shown in figure 2.

Subsequent sorting of the 105 specimens picked up without special attention to their form, showed seven long narrow blades (broken) specialized at the point, (Fig. 2. class A.) eight broken celts specialized at the round cutting edge; (Fig. 2, class B.) thirty-five blocked out forms evidently tending towards shape A; and thirty-six others as evidently tending towards B. Scattered through the refuse were numerous still ruder inchoate masses the intent of which might be said to be still indistinguishable. (Fig. 2, class C.)

In the latter group we had evidently reached that early stage in the chipping process, where all stones modified by but one or two blows, whatever their age and parentage, must look alike, and it seemed to me to mean little that some of them resembled Trenton forms, some ruder shapes from the Somme and Ouse, and some even a worked fragment found by me at the cavern of Langerie Haute. The important fact remained, that the difficulty met with at American Indian quarries,—the similarity of comparatively modern "wasters" to alleged gravel forms was not encountered here. The significant "wasters" of Spiennes were those approaching in form classes A and B, (Fig. 2.) and their evidence reinforced by that of the neighboring collection of M. de la Roche at Harveng, indicated that the neolithic man of these quarries was for the most part, working upon his own make of long narrow blades with specialized points, (Class A.) and celts with round cutting edges finely chipped (Class B.)*; not upon the well specialized leaf shaped form of Abbeville (Fig. 1 B.) or the celebrated "Coup de Poing."(Fig. 1 A.)

But while in Europe no satisfactory work has been done upon the refuse found at neolithic quarries and workshops, scores of which remain undiscovered to tell a possibly different story, and while dozens of specimens scattered on the surface have been unguardedly perhaps classed as "paleoliths" and placed in cases side by side with their brethren from the drift, few who had tramped the gravel pits of Abbeville, St. Acheul and Chelles, would venture to doubt, even though no "implement" in place had rewarded their personal search, that the fact of greatest import had been proved.

The chipped implements or objects are there in place continually associated with quaternary fossils.

Some may be finished implements: some unfinished. As to the most striking among them, (Fig. 1 A.) the study of American quarries and the refuse at Spiennes offers no analogy, makes no suggestion.

Let us wonder still at the state of culture they represent, and for the present rest content with the fact that the men who made them were the contemporary of the Elephas Antiquus, Rhinoceros Merkii and Mammoth.

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*I found no fragments of polished celts at the quarry, though a peasant spoke of having picked them up at Nonvelles, one and one half miles away, a peasant gave me a fragment found, he said, near by in the fields. The patina of all these surface specimens was white.

The implements and "wasters," if we may always call them so, from the English quarries at Cissbury and Grimes' Graves, as exhibited in the British Museum, tell the same story.

THE STORY OF A PIPE.

[BY A. F. BERLIN.]

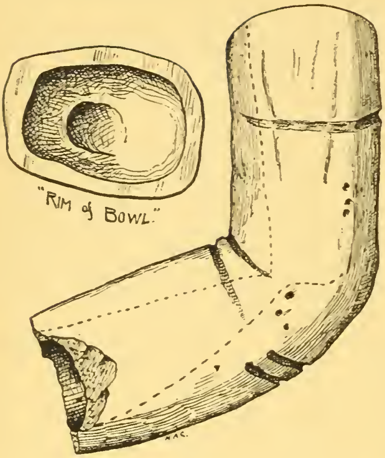
Bengie was the name of a noted Tuscarora Indian, the last chief of that tribe living in what is now Scott county, Virginia. He made it a business to steal white women and carry them away toward the North. In the spring of 1792, in April, which proved his last raid, he and his comrades stealthily approached the stockade which stood where now stands Mendota. The men, it appears, had all left the enclosure to do their day's work in cultivating their fields, leaving the females as guard. It became necessary during the day to go out for wood and water, and as each feared to go alone three of the women who were Mrs. Elizabeth Livingston, Miss Sage and Miss Erwin, volunteered to go together. They had left the enclosure but a very short time when all three of them were siezed by Bengie and his men who with their captives at once made a hasty retreat. The attack was witnessed by Mr. Livingston, then on his way to the enclosure, who hurriedly gave the alarm bringing together all those in the fields. With the men thus gathered no time was lost in making their way, to head off the Indians, toward what is now called Bengie's Gap, in Stone Mountain, now Wise county, surmising they would in their retreat pass there, from where they could be ambushed, cut off and the females retaken. The whites had planned well. They had reached the gap but a very short time when they saw the Indians approach with their prisoners. Before entering the gap Bengie, for he feared an ambush, mounted a big rock, and seeing nothing of his supposed pursuers shouted "HooPee! No white man here". The cry was cut short by the crack of a rifle. The stealer of women had met his fate. Bengie fell backward, his tomahawk flying one way, his pipe another.

Mrs. Livingston and Miss Erwin were retaken. Miss Sage was less fortunate. The band had separated; she with her captors passed a little farther to the East. Miss Sage never returned to her white friends. She married Indian chiefs, and some of her descendants are now living in Virginia.

The chief's pipe then flung away in his death was never seen again until the summer of 1892 when a Mr. Bevins and his son hunting for ginseng found it about five feet from the spot where fell the chief, between two rocks. The men were attracted to the place by the actions of their dog who had discovered some small wild animal.

The pipe of which a figure is given on the following page is made from steatite or soap-stone, and weighs one pound and five ounces. It belongs to the collection of Mr. Brevoort Butler, Enolo, Miss. It is made as is seen without much ornamentation, and the few incised grooves cut into it do not add to its beauty. Whether intended for embellishment, or to commemorate adventures, is hard to tell.

The bowl is near to an oblong, deep three inches. Sides measure two by one and one half inches. The walls at the opening of the perforation are one quarter of an inch thick. The aperture is oval, one and five eighth inches long and one and one eighth inches wide. The stem is two and one quarter inches long, as is also its funnel shaped perforation. The pipe is so made that it rests easily on almost a flat bottom, and always returns to its proper position



after an effort to displace it. Its maker calculated nicely for when smoking no effort was needed to keep it in place. As the material from which it is made works easily it took but a short time to make it which was done with sharp flakes of flinty stone. One can still see the marks caused by these flinty instruments. Col. C. C. Jones figures on Plate 23 of his antiquities of the Southern Indians four somewhat similar pipes, and calls them the ordinary forms of Calumets. He remarks of them on p. 407: "Many of the pipes of this class are made of mica-slate and soap-stone. The latter material being easily worked and generally accessible, seems to have been held in especial esteem."

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EARLY MAN IN MINNESOTA.

In "The American Geologist" (April, 1893), Mr. Wm. H. Holmes has published another long article, this time endeavoring to show that there is no evidence whatever of the existence of early man in Minnesota. The article is very prettily illustrated with fanciful sketches, which Mr. Holmes' practice as an artist makes him to evolve from his inner consciousness, and which he employs in all his writings in place of arguments in support of his theory of the non-existence of paleolithic man in North America.

He says that "Besides the investigations of Professor Winchell and Miss Babbitt, no work has been done upon the archæology of this region, although other writers notably Mr. Warren Upham, Prof. G. F. Wright, and Mr. Henry W. Haynes, taking for granted the correctness of all the original observations and conclusions, have ventured to enlarge upon the material published".

The only "venturing" I have done has been to express to the late Miss Babbitt, who sent to me for examination a large quantity of pieces of quartz collected by herself, the conviction that these fragments were of artificial and not of natural origin. As Mr. Holmes calls them Indian refuse, I can scarcely be charged with very hazardous venturing. Miss Babbitt wrote to me that she had discovered them in undisturbed deposits of glacial origin. If this is true, as I have no reason to doubt it is, certain objects among them presenting the paleolithic type must of necessity be true paleolithic implements, and not, like many of a similar type that have been found on the surface, be of doubtful origin. Everyone knows that such objects are also sometimes found in Indian shell-heaps and village sites. Accordingly, whether any particular object can be positively identified as a true palœolithic implement or not depends upon the conditions of its occurrence. That is a question for geologists to answer, and if they pronounce the site to be of glacial origin the probability is very great that similar objects found in the immediate vicinity are also palæolithic implements. This is the state of the question with respects to the objects found in the Trenton gravels. How does this reasoning apply to the so-called Babbitt quartzes? The glacial man in fashioning palæolithic implements must have produced a great many splinters and fragments, just as the Indian did in producing his implements. If any particular locality offers only one available material to work with, the refuse of palæolithic man and of the Indian must be precisely alike. I understand this to be true of the out-cropping of veins of quartz in the slate in the neighborhood of Little Falls, Minnesota. No one doubts that Indian relics are found in that vicinity, as is always the case at all good fishing sites like that. But Indian implements and palæolithic implements are very different in appearance, and no skilled archæologist will mistake one for the other. I have seen palæolithic implements that Miss Babbitt said she had found in undisturbed glacial deposits. This is positive undisputed testimony. What has Mr. Holmes to say in answer to it? I will quote his words precisely: "My investigations have shown that the glacial quartzes were probably not originally included in the loam but rather that they were introduced into it in post-glacial times, and that they were rude because mere shop refuse, the period of occupation thus, in all probability, corresponding to that of our historic aborigines". This may be very convincing to some people. but to my mind is not quite satisfactory. Professor Winchell says that the quartz fragments are to be be found over a very extensive region "up and down the river an unknown distance," and extending "downward three or four feet" in "hard-pan drift containing boulders". That is something quite different from "loam", the word persistently employed by Mr. Holmes in speaking of the fragments. Loam is defined by Webster as meaning "a mixture of clay and sand with organic matter to which its fertility is chiefly due." If this is the nature of "hard-pan drift containing boulders," I am incapable of understanding ordinary language. Professor Winchell's words can only be understood of undisturbed glacial deposits. But Mr. Holmes says "there is nothing in the conditions and phenomena of the site that will enable us to say whether the beginning of the quartz-working dates back one hundred or one thousand years". He reaches this sweeping conclusion by imagining that Indian refuse from the surface has been introduced into this "hard-pan" by sinking through the decaying substance of the roots of large trees that have been uprooted by a toronado. Let me quote his own words: "The explanation thus furnished of the distribution of the worked quartzes of this locality the glacial deposits to the depth of four feet or more is so satisfactory that no other theories are called for, and little further discussion seems necessary". To my mind this explanation is just as satisfactory, and no more so than Mr. Holmes' former explanation that "most of the so-called gravel implements of Europe are doubtless the rejects of manufacture".

Mr. Holmes first draws pretty pictures, and then draws from them the conclusion that "the record may be so altered in the period of a generation as to be read ten thousand years instead of fifty. Such is the magic of Nature's transformations, and such are the pitfalls set for unwary explorers". Miss Babbitt, the "unwary explorer" in the present instance, is no longer living to defend herself from such assumption as this, but I think all lovers of justice will feel that this is a pretty weak answer to her positive assertions. Mr.

Holmes continues: "The mistakes made by Miss Babbitt are precisely such as others have made through taking up investigation in the geologic department of archæology without adequate knowledge either of the processes and phenomena of geology, or of the arts and habits of our aboriginal peoples". I had supposed that such crass ignorance as this was confined in Mr. Holmes' judgement to myself: but it seems that there are others falling under a like condemnation. How fortunate it is for the rising generation that Mr. Wm. H. Holmes has appeared to set them quite right in regard to the prehistoric archæology of North America. HENRY W. HAYNES.

BOSTON, May 22. —SCIENCE, Vol. xxi, No. 540, June 9, 1893, P. 316.

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THE STONE GRAVE RACE OF TENNESSEE.

[G. P. THRUSTON.]

The ancient history of Tennessee, as it is recorded in its aboriginal monuments and remains, presents an attractive field for investigation. Until a comparatively recent date our knowledge of the conditions of life and the state of society that existed among the native races of America in the prehistoric period has been involved in much confusion.

It is a difficult task to construct exact history from evidence gleaned from the ruins of buried villages and the debris of ancient mounds. Systematic explorations have had to be made. Theories and errors have been considered and cast aside. The remains and relics of different sections have been compared and classified. The work has required laborious and thoughtful investigation, but thanks mainly to the labors of the archæologist we are now beginning to have a fairly correct idea of the ethnic status of the native races in the pre-Columbian period.

Tennessee has contributed its full share of information and material toward the solution of these interesting problems. There has been no more inviting field for archæological exploration in America north of Mexico. In prehistoric times, busy and populous communities lived in the valleys of the Cumberland and Tennessee rivers for at least several centuries, if we may judge from the number of earthworks and cemeteries that mark these ancient settlements. The cemeteries are memorials of special interest. Many of them contain thousands of graves rudely built of stone. Probably not less than 15,000 or 20,000 of these graves have been explored and ransacked by archæologists and relic hunters. So numerous indeed are these ancient burial grounds that we have designated the people whose remains repose within them as the stone-grave race of Tennessee.

Their dead were buried in rude sarcophagi or coffins constructed of slabs of stone. This method of burial was a marked characteristic of the mound-building tribes of Tennessee, especially of Middle Tennessee and a few adjacent sections.

When an ancient cemetery is discovered it is not difficult to locate the exact position of each grave. With the aid of an iron probe or ramrod the exploring expert can sound or probe the earth until he strikes the top stones or cover and finds the corner of the cist. He can then proceed to excavate the earth with much certainty as if he were working amid the remains of a modern cemetery marked with head-stones. In no other section of the United States can archæological investigations be made under such certain and favorable conditions.

These graves are usually from one to three feet below the surface. Sometimes a hundred or more of them are found in a single burial mound, lying in tiers four or five graves deep, but usually they are found in single layers, buried with some regularity, as if the dead had been placed in a potter's field. The stone boxes are generally from four to six or seven feet in length, about two feet wide and eighteen inches deep. When, with the aid of the probe, the stone lid of a cist is discovered, the explorer calls upon his helper or diggers to uncover it. The overlying earth is excavated, the covering stones carefully removed, and he can then proceed to work cautiously with a small trowel with every prospect of a successful find. Usually it will be found that the earth has filtered into the cist and completely filled it: but now and then a grave is discovered so carefully constructed that the remains within it lie uncovered and in open view. The fortunate explorer can observe all the details of the burial, and perhaps may be rewarded by finding a vessel or two of pottery, a gorget of shell or a necklace or ear rings in their original position, without the necessity of using his trowel in searching for them among the debris or compact earth that fills the grave.

These old burial grounds have proved to be rich depositories of ancient treasure. Ceiled up within the enduring cists of stone are found the evidences of the habits and methods of life of this interesting race. Here have been carefully placed the objects that were most appreciated by them in life, their humble tributes of affection, the playthings of their children, their personal ornaments, their implements and utensils and the vessels containing provisions to supply them on their journey to the "happy hunting ground" of the future. Some of them have been nearly as well preserved as were the beautiful vases of porcelain that survived the centuries in the marble tombs of Pompeii. They tell the story of aboriginal life in Tennessee 500 or 600 years ago with remarkable certainty and furnish evidence as to the status of the race in the scale of civilization that the more imposing monuments of other sections have failed to disclose.

From a single cemetery near Nashville seven or eight hundred perfect vessels of pottery have been obtained, besides innumerable other articles of stone shell, bone, horn and copper, illustrating the life and industries of the ancient inhabitants of Tennessee. To one unfamiliar with this subject it is a revelation to see the remarkable collections of antiques and curios gathered from these old graves.

Sets of pottery ware ornamented with heads and grotesque figures—common characteristics of the ware of Peru and Central America—are found. Water vessels, hanging bowls, drinking cups of clay and shell, dainty little vessels—perhaps the toy sets of the children—well shaped images of terra cotta, with faces doubtless typical of the aboriginal race represented by them; all are found there. Many of the shell gorgets or breast ornaments have been engraved with remarkable skill in curious and very exact designs, showing the particular badges or totems of the clan they represent. Ear-rings and pendants of stone, terra cotta and of well-preserved wood, skillfully plated with thin layers of native copper, are found. Sets of flint and bone implements and the kives and needles of the ancient artisans are discovered carefully placed beside their remains.

There are also numbers of pipes of clay and stone, and of beautiful discs, symmetrical, uniform and finely polished, and delicate objects of polished stone and chipped flint, some of them fifteen and twenty inches long, that must have been used by the old chiefs and priests as ceremonial implements and as insignia of their rank or rites.

In a child's grave was found a remarkable terra cotta figure, nine inches long, representing an infant or papoose tied to its hanging or cradle board after the historic Indian style. It was doubtless placed there as a memorial by some loving mother.

A set of fine implements of hard-burned clay, evidently trowels were discovered in a single grave. They were probably the outfit of some aboriginal plasterer, who worked upon the adobe or clay-plastered houses in which the stone grave people once lived. The implements and tools of the pottery-makers are also abundant.

Some of these objects of the stone graves must have been imported from far distant sections of the country: the marine shells from the Atlantic or Gulf coasts, the native copper from the Lake Superior region, the red pipe stone from Western Minnesota, the mica from North Carolina or Virginia. A number of pieces of obsidian or volcanic glass from Mexico, or the Rocky mountain section of the west, have also been discovered, indicating that in prehistoric times the stone grave people must have had communication or trading relations with these distant countries.

Like other ancient tribes of the Mississippi Valley, they were also builders of

EXTENSIVE EARTHWORKS,

mounds and stockade forts. Cone shaped and elliptical mounds of earth are found in all sections of Tennessee—along the river courses, in the depths of the forest, and in the cultivated fields. A cordon of fortified villages, or frontier outposts, in Sumner, Wilson and Williamson counties once surrounded and guarded the populous settlements that clustered about the present site of the city of Nashville.

A cemetery containing more than 3,000 stone graves was located on Brown's Creek, on the field of the battle of Nashville, about five miles south of the city. It doubtless marks the ancient site of a town or city of considerable importance. No other portion of the present territory of the United States was probably more densely populated in prehistoric times than this general section of Middle Tennessee.

Passing to a consideration of the culture status of the stone grave race, a careful analysis of its remains does not indicate the existence of an advanced state of society in ancient Tennessee. Sometimes evidences of apparent culture appear; there are glimpses here and there of semi-civilization, in their objects of art and industry, but upon investigation and comparison they are found to be exceptional and do not really represent an advanced ethnic condition. No prehistoric implement or article of manufacture or melted iron has been discovered among the remains in the Mississippi Valley. Native copper from Lake Superior was hammered into form with much skill, but the aborigines did not even understand the uses of melted galena or lead, the most easily worked of all the native ores.

They left behind them no intelligible inscription indicating knowledge of a written language or decipherable symbol language, no pictograph or inscription in the hieroglyphic writing. In all the vast territory of the Mississippi Valley, they left no piece of stone work of regular masonry, or house, or wall of brick, or evidence of architecture worthy of a semi-civilized people.

Their idols and images are comparatively rude, and of a low grade of sculpture. Their pottery is often graceful in form and outline, but upon surveying it as a whole, it is essentially primitive. Indeed, after more than a century of exploration throughout the wide area occupied by the mound-building tribes, we find that their antiquities and remains tell only the same positive story of primitive barbaric life.

There are many evidences, however, of a state of native society in ancient Tennessee, Missouri, the Ohio Valley and adjacent sections somewhat more advanced in culture, and more progressive than that found existing among the historic red Indians of the early frontier. The stone grave people were evidently North American Indians of the sedentary or village type. They should be placed, we think, in the ethnic scale, in the same class as to culture as the village Indians of New Mexico and Arizona—the Moquis, Zunis and other kindred tribes. They probably spring from the same ancestry.

None of the native tribes of America north of Mexico in the prehistoric period came nearer to the confines of semi-civilization than these old pottery makers and mound builders of the Cumberland and Tennessee valleys.

Unhappily their progress toward a better state was arrested and rudely shocked by some destroying conqueror, or catastrophe, or succession of disasters. Perhaps the rapacious Iroquois, or some horde of savage tribes from the North swept down upon the homes of these humbler villagers and their kindred in adjacent sections and destroyed or absorbed them, leaving only the remains of their forts and mounds and cemeteries to tell of their former existence and primitive life.

The career of North Amtrican Indians is shadowed with painful reflections. It illustrates the infinite pathos of human life. The race must have lived upon this great fertile continent for many centuries, certainly not less than two or three thousand years. Its widespread dispersion, its many languages, its marked physical characteristics, its antiquities—all unite in establishing the remoteness of the period of settlement. In all these centuries of toil and hardship its progress toward civilization was feeble and slow. Its history as written in its monuments and remains, was a succession of advances and reverses. It seems as if the systems of life and government of the American Indian races naturally tended to disintegration and decay. Even the ancient simi-civilization of Mexico and Central America was rude and primitive when compared with that of the ancient races of Europe and Asia.

It seems strange that this splendid double continent of the West should have slept in the solitude of its primeval forests in the ignorance and poverty of barbarism and savagery, through all these thirty or forty centuries, unknown to the enterprising maritime nations of the world. The ships of Phonicia, of Alexandria and Carthage carried their commerce to distant lands and through far off seas, yet no trace of their civilization, of their languages or arts appears to have reached this isolated Western continent.

After 400 years of occupation and exploration, no record or monument or article or implement has been found in any portion of North or South America of old world origin that antedates the discovery.

The North American Indians have already well-nigh passed into history: and will soon be only a memory; but the genius of Columbus, led by the guiding hand of Providence, has turned the daylight of civilization upon the dark continent, and made it possible for a better race, and one more worthy of so noble a heritage, to work out its destiny here.—From "The Daily American," Nashville, Tenn., May 14, 1893.

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PRIMITIVE BREADS.

[BY JAMES MOONEY, OF THE BUREAU OF ETHNOLOGY, WASHINGTON, D. C.]

Among the Indian collections which I was sent out by the Smithsonian Institution to make for the World's Fair was one which would show the bread-making process of the Moquis.

These primitive Indians live in Northern Arizona, and as they are remote from railroads, and as there are almost no whites in that part of the country, they are nearly the same today that they were hundreds of years ago. In fact they are living still in the same houses they lived in when Columbus discovered America.

Their seven stone villages are perched on the summits of perpendicular mesas of solid rock hundreds of feet above the plain, with only one or two narrow steep trails by which to reach them. The whole surrounding country is a desert, but close around the foot of the mesa are several springs, and near these the Indians plant their corn, a hardy kind of their own, which grows with very little water, and from this corn they make all sorts of meal and bread. I don't know how many ways they have of preparing it, but there must be about 50, certainly twice as many as most of our own cooks know.

The corn itself is peculiar. It has small hard grains, like popcorn, and is of all colors—white, black, pink, red, yellow, blue and spotted—each variety of the corn being of a different color. The meal, and of course the bread, too, is of the same color as the corn from which it is made. The loaves of bright pink bread are very pretty.

I spent several days at the nearest village watching the women at work grinding flour and making bread, noting all the arrangements for milling and baking, learning the different kinds of corn and flour, and finding out for myself how they tasted. The women were very good natured in explaining everything. My guide and interpreter was Mr. Keam, the trader who has been among them so long that he knows almost everyone in the tribe.

We arranged with two of the women to come down to the trading post and set up a flour mill and furnace like those in the houses and grind corn and make breads so that I could photograph them at work and afterward buy the outfit and send it on to Washington.

Upon their arrival at the post they went over to the canyon to get the stones for the mill. They picked out and brought in a number of large sandstone slabs, one after another. They used hard stones for hammers to trim off the edges of the slabs. Next they scooped out trenches three or four inches deep in the ground, and in them they sat up the slabs, making a sort of stone box about 7 feet long and 20 inches wide, divided into four equal compartments. The box was set up very near to the building in order that they might brace their feet against the wall as they knelt to grind. One of the women measured the right space by kneeling with her feet and back against the wall, while the other marked off the line in front of her knees. After the slabs were set up they mixed some shaly clay with water for mortar and plastered all the joints and corners until they were smooth and even.

Next they put in the metates or stones upon which the corn is ground. There were four of these, one for each compartment and each had a different grain or surface according to the kind of meal to be made. The first was rough on the surface for making the coarsest meal. The next was of finer texture, for grinding a meal about like our cornmeal. Then came another finer still, and last a smooth stone on which they ground a flour as soft and fine to the touch as any that our millers make from wheat. The roller which went with each metate was made to correspond.

These metates and rollers were of a very hard stone procured from a long distance; we had bought them on the mesa and brought them down.

The metates were set in the four compartments at an angle of about 45 degrees and plastered in firmly with the clay mortar.

The rollers were about a foot long and four inches wide and three-sided. In grinding, the women knelt behind the box. braced their feet against the wall threw some corn upon the sloping metate. and then grasping the roller in both hands bore down with it upon the corn, bending over and giving the roller a half turn at each movement.

This milling is hard, slow work and takes a great part of the women's time, but they make it lighter by the soft, musical "grinding songs" which they sing in time with the motion of their arms.

They constructed a furnace for baking bread by simply setting up two slabs against the wall, about 15 inches apart, and placing across these as a top another slab. This one was of the same hard stone as the metates and rollers, its upper surface upon which the bread pastes are spread being perfectly smooth.

Their piki, or wafer bread, is different from any bread we know. First they mix flour and water, making a bowl of their paste.

Meanwhile a fire has been built under the head slab, and when the stone is well heated the woman dips up a handful of the paste and throws it with a quick motion upon the slab, and before it has a chance to dry spreads and smooths it over the stone until it is even thinner than writing paper. Then she quickly folds it up as she would a sheet of paper, until it looks very much like a small newspaper in the wrapper. This is the piki bread. That from white corn is white, some from pink corn is pink, some is blue, some yellow, and so on through the whole range of colors, excepting green. It is stored away in a cool place and eaten either dry, like wafers, or dipped into water or soup.

From coarse meal they make a boiled bread, patting it into small oblong cakes, which they wrap up in corn husks or the green blades: they bind the cakes in place with strings of yucca fiber. They are then put in a pot to boil.

When cooked the cakes are taken out, tied in neat bunches so as to hang one below another, then are hung upon the wall until needed. The Cherokees and other southern tribes make bread in this way and wrap it up in corn blades. but not in the artistic fashion of the Moquis.

The Moquis also bake the same dough in cakes like our pancakes: others made of blue flour look like our buckwheat cakes.

Many kinds of vegetables, fruits and seeds are ground up and mixed with flour, so that a dinner of breads alone furnishes ample variety to a hungry man. Sunflower, watermelon, squash and muskmelon seeds are among those ground up with flour.

Chile and peaches are mixed in breads, the latter making a very sweet pink bread, while the chile gives a crisp, peppery flavor.

Grass seeds of various kinds and seedy berries are used in the same way.

Blood is mixed with flour to make a dark brownish bread, somewhat in the style of the German blood pudding.

Even ashes is sometimes added, or a fine grayish alkaline earth. to give the bread a saltish taste.

Besides the flour made from the ordinary ripened corn, they have flour from corn steamed in holes in the ground under a covering of earth: also flour from corn grated off the cob while still in the milky stage.

In fact, there is hardly any way in which corn can be prepared without the use of stoves that has not been known and practiced by these Indians for centuries.—From "The Republic," St. Louis, Mo., May 21, 1893.

Man in South America.

There is no part of the world that offers a more curious subject of speculation as to its future than the continent of South America, as was well set forth in an address before the American Geographical Society, by its President, Mr. Gardiner G. Hubbard.

That the Amazon river system alone drains a basin of fertile land, basking under a climate of perpetual summer, greater in area than the whole of Europe, is an astounding fact in itself. This vast territory is practically uninhabited. Its aboriginal population is disappearing, or has disappeared, and the whites who in sparce number take their place, scarcely pretend to come with the expectation of remaining. There are tracts as large as the whole of France, of which we know less than of any equal area on the globe. Tribes of men are living there who are yet absolutely in the Stone Age, and who, even by barter or distant rumor, never heard of the European race or the use of metals.

The question up to which Mr. Hubbard leads his reader is second in importance to none in anthropology—that of acclimation. It is possible for the white race, when it shall be endowed with all the resources of art and science which it is soon to have in its grasp, successfully to fight against the terrible odds of a tropical climate? He quotes in his favor the words of the historian, Buckle, and the naturalist, Bates: he might have added others of weight: but it cannot be doubted that most of the medical observers who have devoted themselves to this vast inquiry, lean to the opinion that never will the white race flourish under tropical skies.—D. G. Brinton, M. D., in Science.

THE BASIS OF AMERICAN ARCHÆOLOGY.—A SUGGESTION.

Those devoting attention to the archæology of the Bible lands and classic regions have wisely taken history as their basis or guide. The students of European archæology have, as a general rule, made the four ages, paleolithic, neolithic, bronze and iron the basis of their system. As America has no ancient history and the four ages are manifestly inapplicable here, its archæology if ever reduced to a system must have some other basis than either of those mentioned. What is it to be? Contrary to my expectation when I commenced the study of our antiquities, I am now convinced that it must and will be LANGUAGE. It is to the linguist the archæologist must look for help to carry him back to the more remote ages, and to sweep away from the field of investigation the numerous theories that hedge his way and retard his progress.

One example will suffice to illustrate the method by which linguists can aid the students of American archæology. For this purpose I select the Mayas. It is now very generally conceded that the ancient works of Yucatan and other parts of Central America occupied by members of this family are attributable mainly to the people of this stock. Dr. Brinton remarks "We cannot identify the builders of the ruined cities of Palenque in Tabasco and Copan in Honduras with the ancestors of any known tribe, but the archæological evidence is conclusive that whoever they were, they belonged to this stock, and spoke one of its dialects". (American Race.)

This determines beyond question that at least some members of the stock had reached this southern section at the time the most ancient of these structures was erected. The age of the ruins is a question to be determined by the archæologist, but the length of time the Mayas have occupied this region or rather the minimum length of that occupancy must be determined chiefly by the linguist. Referring again to the work quoted, we find that this linguistic family embraced some twenty tribes located at various points between the Rio Panuco in Mexico and central Guatemala.

Did this differentiation into tribes speaking different dialects take place substantially in the bounds of the region occupied by the members of the family, or did it take place outside of this area? Is it reasonable to assume that a number of tribes which had become separated from the parent stem to such an extent as to speak a different language, should all emigrate say from the Mississippi valley or the banks of the Columbian river to the same general section? Offshoots have no doubt wandered far away from the primal home of the stock as the Navajos and Apaches from their Athabascan home, but shall we go beyond the limits of the extremes to find the region of differentiation? Of course I speak in general terms without reference to the process of differentiation.

If it be conceded by linguists as reasonable to assume that the division of the Maya stock into tribes took place chiefly in the region where these tribes were first found, then the minimum length of occupancy of the Central American region must embrace a sufficient length of time for the formation of the various languages of the stock, or at least of the major portion of them

What length of time must be allowed for this process is a question which must be left to linguists to decide. That it will reach far back into the past will be conceded.

Apply this rule to the various sections of North America where the conditions are similar and such questions as "Who built the Mounds of the Mississippi valley?" "To whom are we to attribute the Cliff dwelling?" will at once be answered. There will be no ground left for such theories as that the Mayas or Aztecs were the "Mound-builders".

That some stocks, as perhaps the Siouan, have been so split and scattered as to leave the region of differentiation-within reasonable extent-uncertain must be admitted. There are also other exceptions, but it is unnecessary for me to allude to them, as this brief article is intended only as a suggestion to linguists that it is posssible they can assist in solving some of the knotty questions with which American archæologists have to deal.

CYRUS THOMAS.

◆

THE ARCHÆOLOGY OF OAXACA.

Two or three years ago the state of Oaxaca, in Mexico, established an Archæological Museum, and placed it in charge of the very competent and enthusiastic scientist, Dr. Nicolas Leon, of Michoacan, who had already won for himself a wide reputation as curator of the Museum at Morelia. Through some unfortunate political changes the modest appropriations awarded to both these instituions have been diverted into other channels. This is a matter of great regret to all who are interested in the preservation of the ancient monuments of Mexico and the further investigations into the numerous remains there found.

The State of Oaxaca especially has an archæological importance which attaches a unique value to the investigation of its remains. From the earliest days of which tradition records the echoes, it was the home of Zapotecs, and the profoundest researches into the pre-Columbian origin of the Aztec and Mexican civilization point, not to the fabulous "Empire of the Toltecs," but to these Zapotecs as the tribe which first spread abroad the light of a higher culture, who invented the famous sacred calendar, so long the subject of astonishment to the learned, and who constructed edifices of brick and stone whose massive walls, strange ornamentation and remarkable architectural details, place them among the most impressive of any on the continent.

One of these was described, not for the first time, but with considerable care, by the engineer Aureliano Estrada, in the Memorias de la Sociedad Scientifica Antonio Alzate, of Mexico, last year. It is a mass of buildings crowning the summit of 'the Cerro de Quiengola, a mountain some 2,500 feet in height in the District of Tehuantepec. It presents thick walls of stone and burnt brick, circular and square towers, truncated pyramids and all the proofs of an extensive population.

It is sincerely to be hoped that these and numerous other remains in this state will be protected from destruction and thoroughly examined to the benefit of science.

THE ARCHAEOLOGIST.

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EDITORIAL.

Disbanded.

The American Archæological Association, formed several years ago by persons interested in the remains of aboriginal man and who wished to draw into this body collectors who were really uneducated in the science of archæology, has for lack of interest been compelled to disband. Since its formation no meeting has been held. Its members lived too far apart. Many of them, I am certain, could not afford the expense incurred in going to the point indicated for a meeting. The majority of collectors, the writer believes, are not plentifully endowed with the goods of this world, and what little they have to spare they spend for good objects of aboriginal art, for which they cannot be blamed.

Allow the writer now to suggest to those who were members of the disbanded organization and are not subscribers to our little journal, "THE ARCHÆOLOGIST," to at once subscribe for it. It will be a good investment. Its contributors are writers who stand high in archæological science.

A. F. B.

Dealers in Archæological Frauds.

There is living at Jonca, Missouri, a dealer in relics who is a rank fraud. His name is D. Levering. He imposes upon unwary collectors pipes and beads made of clay either by him or by a confederater. He recently sent to a collector in Michigan a clay pipe which he claimed was taken from a grave near his home. It is a glaring counterfeit. He was charged some time ago with doing a questionable business, but as is the case with all dealers of this class, pleaded ignorance and promised in the future to be more careful. He has returned to his old tricks and it is necessary to expose him.

It is somewhat humiliating to the editor to write that in Flag Pond, Virginia, lives G. W. Robinette, who also has again been caught dealing in bogus relics. This is the individual who was charged several years ago with selling Indian relics, pipes, etc., which were proven to be frauds. The editor then had reason to believe that the imputation was brought through a spirit of malice and that Mr. Robinette allowed the counterfeits to pass through his hands because he was ignorant of their nature, and he defended him from what he thought to be an unjust accusation. A short time ago came into our hands two prounounced frauds sent out by Robinette, which he claimed to have picked up from the surface not far away from his home. If he picked them up from the ground he or a confederate were the makers. We have sufficient reason to believe that at Flag Pond, Virginia, and in the vicinity are a number of people making and selling questionable objects which they claim were made by prehistoric people and that they have assistants throughout the whole United States like Levering, who dispose of them.

Those of our readers who will buy relics should hesitate to add to their cabinets any purporting to come from Virginia or Jonca, Missouri. Nor should they invest money in a relic coming from other states or countries unless certain they are true objects of prehistoric art. Only a few days ago was made this statement by an eminent archæologist living at Washington, D. C: "In the investigation of aboriginal antiquities in this country, science has had to contend against all sorts of cheats." Frauds in Indian relics are without number. Most common are the stone arrowheads, spear points, axes, etc., which people in the Ohio valley make a regular business of manufacturing and selling to private collectors and colleges all over the country. Such objects are made by hand. The white man is more industrious than the savage, and using the same methods as were employed by the latter, can turn them out ever so much faster. There is but one way to stop this nefarious business. Do not buy relics unless from dealers having a reputation for square and honorable dealing. Insist that a true history of each object accompany it, and before buying allow an archæological expert to examine it. Then will the collector be certain that he is not being imposed upon and his cabinet will be devoid of spurious objects.

A. F. B.

Col. C. C. Jones.

It pains us to record the death of Col. C. C. Jones, Jr., a noted and lettered archæologist, which occurred at his home in Augusta, Georgia, on the morning of July 19, of Bright's disease. Col. Jones devoted much of his time to research into the antiquities of the southern Indians. The result was a valuable and learned work covering 548 pages, entitled "Antiquities of the southern Indians, particularly of the Georgia Tribes." This title was not meant to embrace alone the Indians once living in the present limits of Georgia, but those of the territory granted by the British crown to the Trustees of the Colony of Georgia. This grant embraced parts of many of the Southern States.

He was a voluminous writer and besides the valuable production just mentioned wrote: "History of Georgia;" Hernando de Soto and his March Through Georgia:" "Siege of Savannah in 1779;" "Monumental Remains of Georgia:" "Life, Labors, and Neglected Grave of Richard Henry Wilde:" and many shorter papers on historical and scientific subjects.

Col. Jones was born at Savannah, Georgia, October 28, 1831, graduated at Princeton in 1852, and from the law school at Harvard University three years later. He joined the Confederate army and served during the war as colonel of artillery. He lived in New York city from 1866 to 1876, where he practiced law and it was during this time that he wrote "Antiquities of the Southern Indians."

CORRESPONDENCE.

Ancient Indian Relics in West Virginia.

Ed. Archæologist:

These are principally found in the western part of the state. On historic Blennerhassett Island, has been found a great many good specimens: such as pipes, pottery, grooved axes, large spear heads, copper implements, beads, etc. My collection contains a great many specimens that were found on the surface of this Island. There is an Indian burial ground two miles north of Parkersburg, on the Ohio river shore. Thousands of war implements have been found there; some of them very fine. A few months ago, with a companion, I excavated three Indian skeletons. On each was found a large boulder. Two of them were found in a sitting posture, with their hands folded over their knees. The other one was lying face down. Their teeth were sound, and they were all in a good state of preservation. Around their necks and wrists we found 700 shell beads, 250 bone beads all sizes, 20 beads made of bear teeth, a few darts, etc.

WOFFORD BROWN.

NOTES.

M. Berthollet recently read a paper before the French Academy of Sciences on the archæological question, whether there was an age of copper prior to the age of bronze. Pieces of copper have been unearthed by M. de Sarzec in Mesopotamia which are apparently older than any found in Babylon. Copper is easily reduced from its ores by carbon, but bronze requires the addition of tin, a comparatively rare metal, as it is chiefly found in Malacca and Cornwall.

* * *

Rich Archæological Treasures Unearthed.

CITY OF MEXICO, July 8.

A few days ago a goat herder was found trying to sell a silver cup of singular but beautiful workmanship, to which was attached the remnants of a chain of the same metal. This cup having the appearance of a censer, the man was at first supposed to have stolen it from some church, but on being arrested and questioned at last confessed that one of of his goats fell in a hole near the ruins of Teotihuacan, a few miles from this city, and while digging out the animal, which in its struggles to escape had brought a heap of rocks and earth about it, he had seen the end of the chain and drawn out the cup.

This story sounding improbable, the fellow was sentenced to prison, but Professor Leroy Duncan, an American archæologist making a prolonged stay in the country in the interests of science, begged to be allowed to see the cup. He gave it as his opinion that it was of ancient date, and using his influence with the authorities for the liberation of the prisoner, then prevailed on the latter to show him the spot where he found the relic.

RICH ARCHÆOLOGICAL TREASURES.

These ruins at Teotihuacan are known to have been erected by the great Toltec monarch, Nezahuacoyoti, who was so far in advance of his time as to declare his faith in one Supreme King, and here established a temple dedicated to "The Unknown God, the Cause of Causes." To this God were made no human sacrifices, the offerings being limited to flowers and sweet-scented gums. Under the law in this country all ruins are to be left unmolested, except at the pleasure of the government, so Professor Duncan was only permitted to excavate the hole still further into which the goat had fallen. He was rewarded by the discovery of a heap of human bones, the skulls of which he unhesitatingly pronounces Toltec in shape. The rest of the chain was also found, with a silver mallet, which was undoubtedly employed to strike the gong of sonorous metal which called the worshippers to prayers at regular seasons, and which, we are told by the manuscript of Ixtilxochitl, was placed on the top of the temple tower. Professor Duncan gives it as his opinion that if the government would consent to the excavation of these ruins many treasures of archæology would be discovered.—Philadelphia Times.

Mrs. H. M. Kunzie, of Seattle, Wash., has, during a long residence on the spot, collected at the mouth of the Umatilla River, Oregon, the very stone gods, Tohil, Avilix, and Hacavitz, of the Quiches, or at least exact images of those found in the Quiche region of Gautemala. She has also gathered at the same spot a magnificent collection of Mexican stone relics, including obsidian knives, mortars, calendar-stone, bronze sword, metals, etc., in short, a thoroughly characteristic collection of Mexican antiquities—rare, complete, and priceless.—Judge Wickersham in "Proceedings of Tacoma, Wash., Academy of Science.

* * *

Mr. H. C. Mercer writes to the editor under date of June 27:

"I have just found—June 23—another small argillite quarry on left bank of Neshaminy creek, three quarters of a mile above the mouth of Mill or Lahaska creek, under the cliffs of metamorphosed slate overhanging the stream there.

Masses of argillite lying in place have been picked as at Point Pleasant to split with the grain, and chipped into the now familiar leaf-shaped pattern.

A layer of refuse and 'turtle backs' about three hundred yards long, has been exposed by the wearing away of the banks. At Point Pleasant we were twenty-five miles from Trenton; here we are but fifteen.

* * *

Fossilized Human Remains in South America.

The critical scrutiny of the evidence of paleolithic man in North America, which has lately occupied considerable attention, has perhaps been pushed too far. When, as in the Ohio field, discoveries have been made which can not be gainsaid, it is scarcely fair to prefer every conceivable explanation of them to the simplest one—that the articles were originally deposited where found.

Meanwhile, in South America, some interesting facts are communicated by Mr. Roth, of Buenos Ayres, to Professor Kollman, and published by him in the Mittheilungen aus dem Anatomischen Institut, at Basel. Mr. Roth was the discoverer of the skull of "Pontimelo," which, by the way, he informs us is a typographical error for "Fontizuelos." This skull, together with some other human bones, was found under the carapace of a glyptodon of extinct species, and Mr. Roth argues that the man and the animal were contemporaries. He does not seem to have contemplated the possibility that men of later times may have found the carapace, and with it piously covered the remains of one of their dead. He asserts, however, that Doring, Burmeister, Ameghino, Moreno, and other leading geologists of the Argentine Republic, have acknowledged the contemporanity of man and the glyptodon.

Roth cites a number of instances where human remains have been found in the upper Pampas formation. In 1887 he unearthed for the first time some in the middle Pampas strata; and in the same, both he and others have found numerous pieces of pottery, an artificial shell heap, and occasional silex points of human workmanship. He insists that there is no room for doubt that whenever the so-called "Pampeano Intermediar" was deposited, man was then living there. This time, if Ibering is right (see my note in Science, April 14), was in Pliocene (tertiary) days.

Professor Kollman brings this into connection with other early finds in South America, and reaches the conclusion: "That the discoveries of ancient human remains in America prove that the various American races nhabited their continent quite as emote in time as did those of Europe nd Asia, their respective localities;" which expression leads to the inference that he is a polygenist, or, else, seeks the cradle of the species outside these three continents.—Dr. D. G. Brinton, in Science.

* * *

Is it a Paleolith?

A stone axe has just been found in a field about eight miles northeast of this place, which very nearly proves, if not quite so, that man existed during, or prior to, the glacial period in North America. It was found by A. A. Newlin, on the summit-level in this (Parke) county, Indiana, on the south side of Sugar Creek. It is six and seven-tenths inches long, two and three-fourths inches wide on the blade, four and three-tenths inches wide at the groove (or eye of our steel axes), three and one-half inches wide at the "back," or "poll," and is one and six-tenths inches thick, and, I am confident, was, when first made, nearly two inches thick.

One side is ground flat, and by glacial action, without any doubt. By that grind the groove was planed almost out on that side, and has been re-cut or filed out by some Indian long ages after the Indian who first fashioned the axe. The striations run from edge to poll, and the axe was moving edge forward, as the striations indicate, for they are deeper cut toward the edge, and weaker, become shallower and less distinct, toward the poll.

The opposite or convex, side of the axe has been striated just enough to produce a distinct plane, which inclines to (or from) the flat side about eleven degrees.

The poll, the ends (as timber men call that part of toe axe nearest to and farthest from the hand when using), the present convex side, and the grooves around the ends show the oldest and deepest weather-pits. Then the glaciated, flat sides show the next oldest weathering. Next, the newly-deepened groove on the flat side, and, also, a little deepening of the groove on the convex side, where the grinding had made the groove somewhat shallow, show the next oldest weathering; and, at last, the smooth, whetted edge shows very little weather wear.

This axe was found about one hundred miles north of the southern boundary of the glacial drift on the Wabash River. I have found eleven places in the county where the rock, in place, is strongly and clearly glaciated, and three places have been found by other parties. The erratic bowlders which are striated on one to five sides are countless (to say nothing of those not marked), and I have examined them and studied them a great deal, and think I am not a bad judge of their comparative exposures and decompositions. As a result of my experience and judgement, I am strongly inclined to believe that this axe was made before, or during the glacier. That it was lost, or in some way fell into the sweep of the glacier and was ground flat on one side and striated a little on the other. That, after the glacier had receded, it was found, repaired, sharpened, and used till the steel tomahawk took its place, when it was cast aside. I feel confident that experienced archæologists will so decide.

Jno. T. Campbell.

Rockville, Ind.

[Science, Vol xxi, p. 346, June 23. 1893.]

* * *

Man-Eating Indians.

Dr. Walter J. Hoffman, of the Bureau of Ethnology, writes: Since the subject of the "Origin of American Races" has been studied by various antiquarians, some curious facts have come to light, which are not to the credit of the aborigines. The noble

Red Man, as he exists today, is not the type of humanity he is generally represented to be by those who are appointed to investigate the wrongs and irregularities so frequently reported. Their natural instincts are unrefined in the majority of cases, and cruelty is, and ever has been, one of their most prominent characteristics.

We have but to go back a short historical period when the tribe, composing the Six Nations, were cannibals. Nevertheless, such is the case. Of all the American tribes, those inhabitating the Carribean Islands were the most cruel and ferocious. Their captives were nearly all tortured to death before being prepared for the "royal" repast. The early Spanish explorers have handed down facts ad infinitum, treating upon these customs, and no doubt many a missionary, Jesuit, or Franciscan monk was broiled and tickled the palates of the cruel wretches.

The pre-historic races of Florida—the builders of the numerous shell-heaps—are shown to have been cannibals: and later, I believe the last instance of man-eating occurred among the Six Nations, of which our Delawares (Lenni Lenape) were sub-tribe.

The Rev. John Heckewelder, who penetrated the interior of Ohio in 1743 (?) and whose residence among them was of forty years duration, has given us many facts regarding the early history of these tribes.

In a communication to the Historical and Literary Committee of the American Philosophical society (bound MSS. 1821) he quotes from the Rev. C. Pyrlæus's MS. p. 235, as follows: "The Five Nations formerly did eat human flesh they at one time did eat up a whole body of the French King's subjects. (Troops) they say 'Eto niocht ochguari,' which is: Human flesh tastes like bear's meat.—They say the hands are not good eating, they are jozgards; (bitter)" The Five Nations afterwards received the Tuscaroras, which made the sixth tribe, after which they were called the Six Nations.

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BRITISH stone implements: A complete set of drift and neolithic implements, forty specimens: three guineas. All genuine, warranted. G. F. Lawrence, Mem. Anth. Inst., 55 High St., Waudsworth, England. 11

FOR each arrow point or drill over 3 inches sent me I will send in exchange a piece of aligator iron ore, a rare beautiful cabinet specimen, valued at from 25 to 50 cents each. Have only 20 pieces. Chas. Clickener, Tangier, Ind.

FOR EXCHANGE.—Documents on Paleontology, Geology, Archaeology, Ethnology, Artic Regions, Surveys, etc., for similar publications. What have you? What do you want? Address, Book Exchange, Toledo, Ohio. Dealers in second-hand books, please send catalogues. tf

FOR SALE or exchange, for scientific and historical books, 600 arrow and spear points, 10 stone celts, a pestle, and 3 grooved axes: also other relics. Write, stating what you have for exchange, and what you want in return. All letters answered. L. V. McWhorter, Berlin, W. Va.

SMITHSONIAN Reports, parts 1 and 2 1889 and 1881: odd numbers of American Antiquarian, minerals, scrapers, knives, fresh water and land shells to exchange for Smithsonian Reports, 1885, part 2, 1884 or 1880, or good Indian relics or minerals. Correspondence desired with collectors of Indian relics. G. E. Well, Manhattan, Kan.

The Archæologist.

VOL. I. WATERLOO, INDIANA, SEPTEMBER, 1893. NO. 9.

TRACES OF GLACIAL MAN IN OHIO.

Trenton and the Delaware Valley no longer have exclusive claims to reputed evidences of glacial man. For a number of years reports have come from the West of finds of implements in ice-age drift. Miss Babbitt in Minnesota, Cresson in Indiana and Metz and Mills in Ohio, have in turn announced the discovery of specimens of these rare and precious mementos of antiquity. I have already, in papers published in THE JOURNAL OF GEOLOGY and in the AMERICAN GEOLOGIST, raised questions as to the proper interpretation of the finds in Trenton and at Little Falls, Minn. A brief study of the Ohio finds may now be undertaken with a view of presenting and weighing such doubts as may have arisen with respect to the value of the evidence furnished by them. I have endeavored in this, as in the other cases, to keep well within the bounds of legitimate criticism, desiring to allow all that can be justly claimed for the evidence presented in support of the theory of a glacial paleolithic man in America. In dealing with this subject, however, I have found it necessary to keep in mind the fact that the evidence to be considered has been collected and presented by advocates of the paleolithic theory who have welcomed finds without critical scrutiny, and have reached and presented conclusions as much because they were in the line of the expected and desired, as because they were actually susceptible of demonstration. The advocates of the theory have naturally taken every opportunity to emphasize the importance of the evidence collected as viewed from their own standpoint. To insure correct final judgment it is necessary that other points of view be taken and that the evidence be subjected to every possible test. I shall confine myself to fields in which I have made personal and most careful observations. I do not desire to secure the acceptance as final of any particular view with respect to the history of early man in America. I am not introducing or advocating a theory but attempting to insure the non-acceptance of any theory, howsoever plausible, that is not supported by conclusive proofs. Others have undertaken to show how much proof Ohio has furnished in support of a particular hypothesis; they cannot now object to my attempting to show how insignificant this proof really is.

At the meeting of the American Association for the Advancement of Science in Washington, in 1891, much attention was paid to glacial geology, and one paper by Mr. Frank Leverett, of the Geological Survey, treated of the gravels of Loveland, O., and of the finds of implements in them by Dr. C. L. Metz. Mr. Leverett was then about to return to Ohio and I resolved to accompany him to the Little Miami Valley with a view of making a brief preliminary study of the gravels and their contents. A week later Dr. Metz joined us at Loveland, and we proceeded at once to the great gravel pits just west of the village.

After three visits, and the most careful but entirely fruitless search for rel-

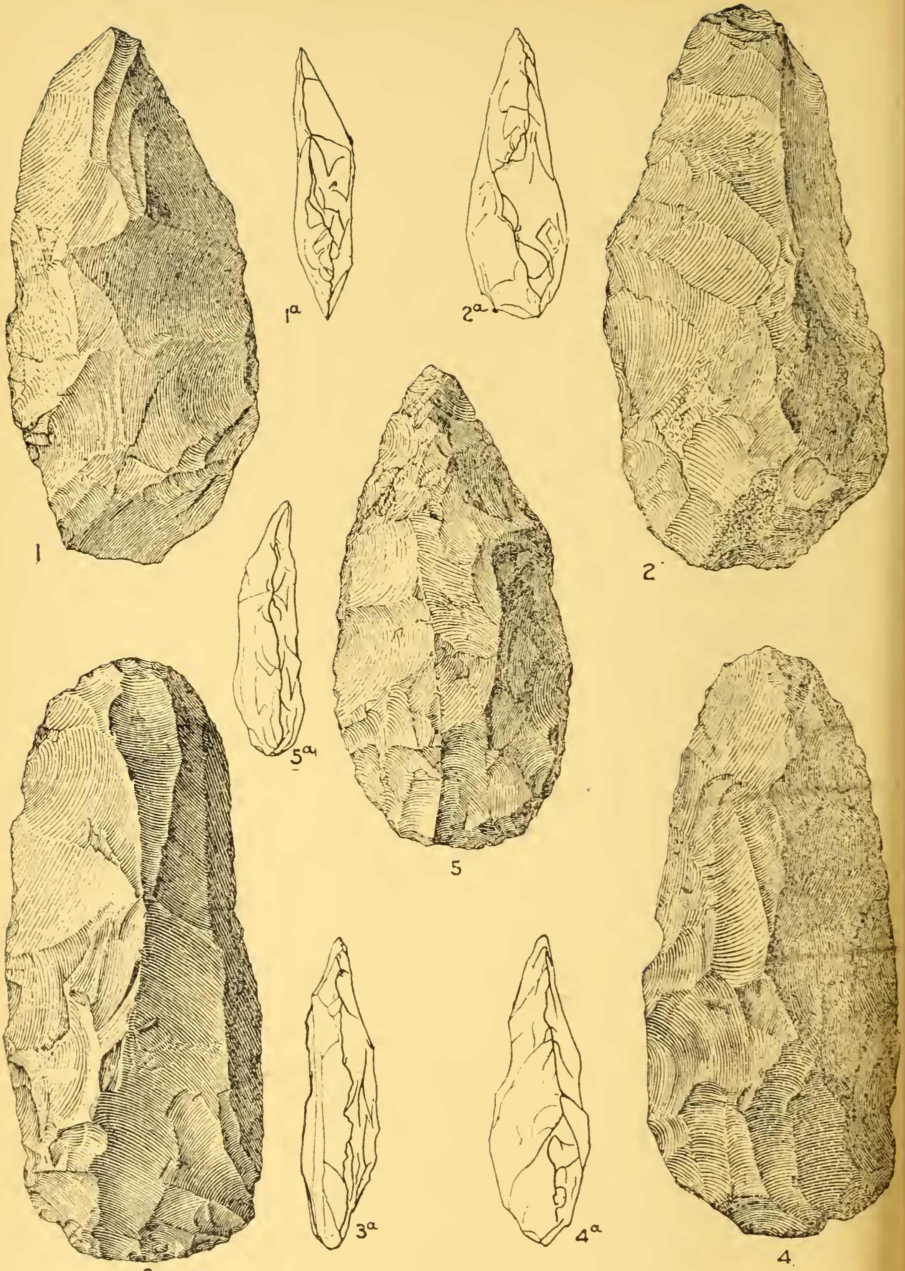

Plate illustrating the Newcomerstown "paleolith," copied with all possible care from the cut in "Man and the Glacial Period," and four ordinary rejects of the blade-maker, the latter obtained in three cases from modern flint shops in the same region, and in the fourth case directly traceable to the same shops. The separation of the "implement" of glacial age and paleolithic type from the modern rejects is left to the reader. Three-fourths actual size; the profiles on a still smaller scale.

ics of art from bottom to top of the gravel walls, I found myself wondering whether there had not been some mistake, whether the objects found were really tools, or whether the collector had not mistaken materials descended from the surface deposits for gravel in place. It is unfortunate that the statements of collectors in such cases, correct or incorrect, cannot readily be subjected to competent tests of verity; we must be content with hedging them about with all available restrictions in the way of negative evidence.

Having, during the first visit, examined the site at some length, we proceeded to the office of Dr. Metz, in Madisonville, and were shown two objects obtained from the pit at a depth of about twenty-five feet beneath the surface. The smaller of these, a dark flattish piece of cherty, slightly waterworn stone, was rudely flaken along one edge, but the evidence of design was not at all convincing, and it seems useless to place the specimen in evidence. The other object was apparently a work of art, exhibiting decided indications of design. It was found in the main gravel pit about twenty-five feet from the surface, by Dr. Metz, who expresses his full belief that it was in place in the gravels when found. A third slightly flaked stone from the same locality and position had been forwarded to the Peabody Museum at Cambridge. On examining this specimen at a subsequent date I found that it has no features that can with certainty be described as artificial.

It is not from a desire to discredit the observations of Dr. Metz, who is a most reputable and more than usually capable observer, that I raise the question of the verity of these finds, It is essential, in a case where so much depends on the finding of a single specimen, that every observation relating to it should be placed upon record in such a way that, in the future, judgments as to the value of the evidence may not be based entirely upon the testimony of a single observer whose acquirements may be restricted or whose preconceived notions may give a very marked bias to his observations ond deductions.

Referring to the Loveland site, it may be remarked in the first place that it seems improbable that man would have occupied an area overrun by torrents capable of transporting, and transporting almost exclusively, the coarse materials forming these deposits, and the chances of the preservation of artificial features of specimens brought by floods from the valley above are extremely slight.* Of course, if man existed here during the glacial period, he may have sought the raw material for his rude arts on the banks of this stream during the periods of low water and may have thus left the refuse of his shaping operations at almost any point: but a single specimen cannot, considering possible errors of observation, be regarded as sufficient for the establishment of such a conclusion.

In the second place, I may mention the fact that on carefully examining the Loveland specimen, I found it partly covered with dark, well-compacted earth, resembling the soil of the surface of the terrace, rather than the light-colored, fine-grained calcareous powder characterizing the matrix, such as there is, of the gravel deposits. It seems to me that there is in this observation, made also by Mr. Leverett, and still subject to verification if the specimen has not yet been cleaned, sufficient ground for raising the question as to whether it is possible that Dr. Metz could have mistaken a surface mass, descended into the pit from above, for gravel in place. Dr. Metz, or any other observer not a professional student of geologic phenomena, especially of talus phenomena, involving materials subject to resetting after degradation, or to sliding EN MASSE, could readily be excused for making a mistake of this kind. It is vain to hold that there is no danger of mistake in such a case; the chances of error are really very great, and a little slip like this in observation would falsify the chronology of human history in this valley to the extent of some thousands of years.

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*The edge of the continental ice sheet was, according to Mr. Leverett, only about eight miles distant when these gravels were formed, which make the probability of finding implements here still slighter.

It may be remarked that the terraces of the Little Miami were for a long period occupied by mound-building tribes whose implements and refuse of manufacture are scattered everywhere, and it is entirely within the range of possibility that such a partially worked specimen as this should have been left by them in the surface loams on the site of this pit at Loveland.

As to the nature of the object itself, a number of questions may be raised, and we are justified in making all possible inquiries. It is a pick-like object, some six inches long, and perhaps two inches thick toward the larger end. The head is rounded, as if intended to fit the hand, and there is even an appearance, deceptive, no doubt, as will appear further on, of abrasion by use. The sides are neatly flaked, the apparent result of blows by a hammer, many of which seem to have served only to batter the edges, while others appear to have removed a series of flakes extending along the shaft from the head to near the point. The smaller end of the object is worthy of especial notice; the point, which probably was originally sharply pyramidal, has been removed by an oblique fracture, leaving a clean, unworn surface. A portion of the surface adjacent to the truncated point has not been shaped by flaking, but retains the original minutely granular weathered surface, indicating that the stone before flaking or remodeling was already pointed. The object was therefore not used after the breaking of the point, as the unworn fracture shows, and the presence of the unaltered original surface adjacent to the present point would seem to prove that it never was subjected to use. The material appears to be a fine-grained, light-colored limestone, having a conchoidal fracture. It is soft and brittle, and is not likely to have been employed in making tools, and especially pick-like tools. The observation leads to an inquiry as to whether it is possible that the flaking could have been the result of natural agencies, such, for instance, as the crushing and abrading forces exerted by moving ice. Could a pointed bit or mass of brittle limestone have been so squeezed between moving impinging rocks as to remove these flakes and to produce the battered and rounded effect seen upon the edges and head, respectively, of this object without affecting the point, save to break it, and without breaking the shaft elsewhere? That natural forces do occasionally produce forms resembling those of art is well known, and that archæologists have at times been rash in accepting such as artificial cannot be denied.

To more fully inform myself upon this topic I made careful examinations of the contents of the moraine from which portions, at least, of these gravels descended. I was somewhat surprised with the results, which proved so interesting and suggestive that they may well be referred to in this place. In a railroad cut recently made through morainal deposits near South Lebanon, about eight miles north of Loveland, I found numerous pieces of this brittle limestone, varying from minute bits to masses a foot or more in greatest dimension, showing traces of fracture and flaking resembling somewhat closely those of the implement or object found by Dr. Metz at Loveland. Indeed, some of these specimens are so well flaked that I would, under ordinary circumstances, not hesitate to call them artificial. In fact, all may be artificial, although the shapes are often eccentric, and the size, in cases, is greater than in any known flaked tool. It is a significant fact that nearly all the stones found in the deposit are covered with glacial striæ, and some of the conchoidal faces of the implement-like objects are scratched, through movements of the ice. It is true that man may have lived or hunted on or near the ice, and his tools or the refuse from their manufacture may have been taken up by the ice, passing afterwards into the moraine; but that they should enter the ice in numbers, and so become striated through its movements, is highly improbable. The Loveland specimen has, however, a more decidedly artificial character than any of these, and were its inclusion in the gravels fully verified, and were it not alone and practically unsupported by other finds, it could well be accepted as important evidence of glacial occupation by a stone-flaking people.

Besides the Loveland finds, Dr. Metz obtained a specimen of rudely flaked black chert from a cistern which he was sinking in Madisonville, O. It was found at the surface of, or slightly imbedded in, gravel beneath a bed of silt eight feet thick.* Dr. Metz is a careful observer, and it is hard to believe that he would have permitted himself to be deceived although all must admit the possibility of such deception. I have examined the specimen, now in the Peabody Museum, and find it to be identical in every essential feature with typical rejects of the modern blade-maker, lacking the least indication of specialization. It is not safe to call it an implement, no matter what its age, and to present it as evidence of paleolithic culture is little short of folly.

Another discovery, to which much attention has been given on account of its supposed bearing upon the paleolithic question, was made in 1889. Mr. W. C. Mills, of Newcomerstown, Tuscarawas Co., O., found a single specimen of chipped flint in an exposure of glacial gravel in that place. The specimen fell into the hands of Prof. G. F. Wright, by whom it has been widely exhibited and published. A cut of it appeared in his "Man and the Glacial Period," from which work a brief extract may be given in this place. He states that Mr. Mills found this "finely shaped flint implement sixteen feet below the surface of the terrace of glacial gravel which lines the margin of the Tuscarawas valley. Mr. Mills was not aware of the importance of this discovery until meeting with me some months later, when he described the situation to me, and soon after sent the implement for examination. In company with Judge C. C. Baldwin, president of the Western Reserve Historical Society, and several others, a visit was made to Mr. Mills, and we carefully examined the gravel-pit in which the implement occurred, and collected evidence which was abundant to corroborate all his statements. The implement in question is made from a peculiar flint which is found in the Lower Mercer limestone, of which there are out-crops a few miles distant; and it resembles in so many ways the typical implements found by Boucher de Perthes at Abbeville, that, except for the difference in the material from which it is made, it would be impossible to distinguish it from them. The similarity of pattern is too minute to have originated except from imitation."*

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*Putnam, F. W. Proc. Boston Soc. Nat, Hist., Vol. XXIII, p. 242.

Wright, G. F. Ice Age, pp. 530-532.

Leverett, Frank. Am. Geologist, March, 1893, p. 187. According to Mr. Leverett it is not certain that these silts belong to the ice age, and if not, the find is no evidence of glacial man, whatever else it may signify.

A statement made by Mr. Mills gives the following additional details:

"While examining the different strata of the gravel, I found the specimen that you have before you fifteen feet from the surface of the terrace. The bank was almost perpendicular at this time, exposing a front of about twenty feet. The small part of the bank was in place in the side of the terrace, until I struck it with my walking-cane, when a space of about six feet in length by two feet in height tumbled town, exposing to view the specimen. At first I recognized the peculiar shape and glossy appearance of the specimen, such as were characteristic of paleolithic specimens described to me by Professor Edward Orton, while I was a student at the Ohio State University."†

A re-statement embodying additional minor details and placing the evidence fully and finally upon record. an excellent thing to do. appeared in SCIENCE for Feb. 3, 1893.

The question may now be raised as the value to be attached to this find, since the observation is one upon which much is made to depend. In September, 1892, I visited Newcomerstown and examined the site of the discovery of this interesting object, which is shown in the accompanying plate. The town is built along the margin and on the slopes of a glacial terrace, formed about the end of a spur of the hills which projects into the valley on the north side of the Tuscarawas. The exposures of the gravels in the railway ballast pit are excellent, showing them to be ordinary irregular bedded deposits of sand and gravel. It is a sufficiently promising place for the recovery of such implements or objects as the gravels may happen to contain. The formations are very loosely bedded, and it takes but a short time after the desertion of the site by workmen, especially if the weather is wet, to cover the exposures with talus. Large masses are liable to fall, carrying with them all objects resting upon and near the surface. A collector not on his guard. or not appreciating the nature or significance of finds, might readily, when afterwards questioned about the matter, give a faulty diagnosis of the conditions of discovery. The case in hand is one in which double assurance of verity is called for, yet it is one in which uncertainty resulting from the lack of experience and possible, I may say probable, carelessness of the collector is augmented by the treachery of the gravels. This uncertainty is again emphasized by the discovery, made at the time of my visit, that this terrace is probably an old Indian village site, and certainly a shop site where flint was flaked, many rejects and flakes occurring upon the very brink of the pit. Of course I found no duplicate of the specimen in question, for duplicates are RARÆ AVES: but I saw enough to convince me of the danger of hastily and unqualifiedly making use of the observation made by Mr. Mills, especially since the material of which this object is made occurs in the neighborhood, and must have been used by the Indians inhabiting this site.

There is no doubt that this specimen suggests, perhaps more decidedly than any other American so-called gravel implement thus far collected, a resemblance to one of the well-known European types of implements. This is noted by Prof. Wright, and may be regarded by many as a point worthy of attention. We must, however, look with extreme caution upon deductions drawn from or depending upon analogies of form. Close analogies of form between Indian rejects and some varieties of European paleolithic objects are too common to permit the attachment of much value to this feature of this or any other similar find.

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*Wright, G. F. "Man and the Glacial Period," p. 251.

†Report of Western Reserve Historical Society, Dec. 12, 1890.

As to the surface polish, that is a common feature of the Ohio flints, and I have before me during this writing a tray of quarry rejects that have the same glazed effect. This is a characteristic of the stone, and has no bearing upon questions of age or use or culture, and must be considered as without significance in these connections.

Prof. Wright is entirely satisfied with the results of his efforts to corroborate the statements of the collector. He has examined and reexamined Mr. Mills, receiving every assurance of the verity of the find, but after all he really secures no additional assurance and can receive no fully satisfactory assurance that Mr. Mills was not in error. Prof. Wright has visited and photographed the site and will speedily prepare a plate for publication,* for just what purpose, however, it is rather hard to see, since the nature of the gravels is not disputed, and a volume of photographs, not made at the time, will not give additional weight to the proofs. A photograph made of the tree after the bird has flown will not help in determining the bird. No more will comments on Mr. Mills' moral character, his education or business reputation, eliminate the danger of errors of judgement or observation. The specimen may not have been found in place notwithstanding all possible verification, and it may be a reject notwithstanding its resemblance to foreign types, and Prof. Wright may be wrong in urging his conclusions upon the public, notwithstanding his painstaking efforts to secure all possible affirmative testimony.

It is nowhere stated that Mr. Mills actually picked the specimen out of the gravels; it was probably loose when he discovered it. but even if he could say that it was fixed in the gravel mass, the necessity of questioning the find would still exist: All the authentication Prof. Wright can possibly secure will not enable him to determine whether Mr. Mills struck with his walking stick a mass of the gravel in place at a depth of sixteen feet, or whether he was dealing with a mass which had slid with its inclusions of modern relics from the surface to a depth of sixteen feet. The object MAY HAVE BEEN in place, but can we afford to decide momentous questions upon the evidence furnished by a single specimen obtained under the conditions existing in this case, and by a collector who for months after the finding "was not aware of the importance" of the discovery?

At Warsaw, in Coshocton county, fifty miles west of Newcomerstown. I visited an exposure of gravels in a railway cutting, the conditions being almost identical with those at Newcomerstown. The terrace, as in the other case, has been occupied by Indian flint workers, and being in the proximity of extensive flint quarries, there is much refuse of manufacture. I gathered a peck of turtle-backs and rude objects of paleolithic types from the level ground above, and in the wall of the gravel pit found several pieces, descended from the surface, that would be freely admitted into the paleolithic family by its sponsors. Work in the excavation had ceased several months before, and the face of the bluff, nearly thirty feet high and two hundred yards long, was well veneered more or less deeply with talus deposits, through which in places and especially near the top, the normal gravels could be seen. The redistributed deposits along the base of the steep slope were well reset, and from these I obtained a number of flaked flints: several of which were firmly imbedded, and two of them were removed from the gravel with some difficulty and with the aid of a pick, one twenty-five and the other twenty-seven feet beneath the surface of the terrace. The latter specimen is shown in the accompanying plate.

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*Wright, G. F., Science, Feb. 3, 1893.

In studying this section at Warsaw I was led to realize the folly of hastily using inexpert evidence regarding the finding of relics of art in gravels. In a case like this even the experienced scientific observer, whose attention had not been definitely called to the nature and far reaching significance of such finds, might from a casual observation have recorded the recovery of one or more of these objects from the gravels. The danger would be greatly increased if the observer were only a relic hunter, or if he were convinced that the gravels at any depth might be expected to contain such objects. These specimens were in the gravels, firmly imbedded, and to all appearances this particular portion of the deposit was in a normal condition. Any one could here have dislodged a portion of the mass with his walking-stick, with fair prospect of finding a flaked stone of paleolithic type. I doubt very much if we are justified in using the casual observation of an inexpert collector at all in questions where there is no other well-established body of evidence with which to associate it. The function of such data does not extend legitimately beyond the confirming of testimony already well verified.

I present in the accompanying plate examples of the finds from the gravel talus and from the shops above. They correspond very closely in material and appearance with the Newcomerstown specimen, as will be apparent from an examination of the plate. The figures are presented without identification in order that the student may, by an effort to distinguish them, convince himself of the similarity of the supposed paleolith to the quarryshop rejects of the region. I am not satisfied with the drawing of the former specimen which is a copy, the best that could be made, of the cut published in "Man and the Glacial Period." I desired to have a new drawing direct from the specimens, but a request looking to that end, made to Prof. Wright, met with no response.

The four quarry-shop failures here shown are not rare finds with unusually implement-like features. They are everyday rejects, and four hundred could be presented as readily as four.

Summing up the evidence of gravel man in Ohio, assembling all of the finds of several earnest workers these many years, we have to consider three specimens only. The finding of these objects seems ordinarily well attested, and there is not the least hint of deception or partial withholding of details of discovery. The specimen found by Dr. Metz in his cistern was eight feet deep, and on, or in, the surface of the gravel bed beneath eight feet of silt that may or may not be glacial. Eight feet is not a great depth, however, and we are justified, so long as the specimen stands alone, in expressing our fears that it might, through some unsuspected disturbance of the soil, artificial or natural, have been introduced or covered up to this depth at some date in the long period separating the ice age from the present. A number of agencies known to disturb the soil to considerable depths, are referred to in my paper on early man in Minnesota, in the April number of THE AMERICAN GEOLOGIST, and Mr. Frank Leverett, in the March number of that journal, dwells at some length upon this subject. In response to an inquiry, I received the following note from Dr. C. Hart Merriam, the naturalist, on the burrowing of native animals:

"In reply to your inquiry respecting the depth to which our burrowing mammals penetrate, I regret to say that precise information on the subject is somewhat meager. A number of species, such as our woodchucks or marmots, skunks, foxes, coyotes, badgers and prairie dogs live in burrows of greater or less depth which they construct for themselves. In a few instances these burrows are known to extend to a depth of eight feet or more. One of the gophers is said to dig a spiral well fifteen feet deep. Badgers and prairie dogs are notorious diggers, making vast numbers of holes and bringing up immense quantities of material from unknown depths. Their burrows, moreover, are usually very steep, so that a stone or other object falling into one would descend to a considerable distance before being intercepted. Badgers and coyotes make very large holes, though small in comparison with those of the large wolf, which was formerly abundant throughout the Mississippi Valley; the burrows of the latter animal are of sufficient size to readily admit the body of a small boy."

The Loveland specimen was recovered at a great depth beneath the surface but we are bound to raise the queries, Is it an implement? Was it in place; and what is the meaning of the dark soil found on its surface? Of the Newcomerstown specimen it may be said that the collector had little knowledge of the nature of the gravels and of the treacherous character of talus deposits, or of the importance or peculiar bearing of the find. There is, therefore, a most serious possibility of error. There is a decided chance that errors of observation may have crept in in all the cases.

And what is the story of the specimens themselves? The Madisonville object is to all appearances an ordinary reject of the flint-blade maker. It can be practically duplicated upon almost any quarry-shop site. The pick-like object from Loveland is somewhat unique, and thus has a certain interest of its own, independent of the manner of its finding. At best, however, it was probably not a finished implement at all and there is strong evidence that it has never been used. It may not have more than a remote resemblance to any tool ever employed by the occupants of the valley. The Newcomerstown object appears to have a marked resemblance to certain foreign implements, but the Tuscarawas valley flint-shops furnish many other specimens whose analogies are nearly if not quite as close.

These specimens constitute the Ohio evidence. There is nothing more, for it would be a great mistake to present surface finds as "paleoliths" or as gravel art, no matter how close their resemblance to these or to European forms. It is safest to assign all to the historic Indian save those obtained and proved to have been obtained from the gravels in place.

These three specimens furnish the most satisfactory proofs, so far collected, that a glacial, paleolithic man inhabited the Ohio valley, and upon the evidence of these three slightly shaped stones, obtained from isolated localities, it has been proposed to carry the history of man back some thousands of years farther than can be done by any other means yet discovered.

No careful student will venture to say that the evidence furnished by the three specimens is satisfactory and conclusive. The finds are not demonstrably implements but have the characteristics rather of rejects of manufacture. Their employment as evidence of a PALEOLITHIC STAGE OF CULTURE serves only to emphasize the utter inadequacy of the available proofs on that point.

Considering the meagre and unsafe nature of these proofs, there seems little doubt that a GLACIAL MAN for the Ohio valley has been somewhat prematurely announced and unduly paraded. W. H. HOLMES.

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THE MEETING OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

The Forty-second Meeting of the above Association was held at Madison, Wis., August 16 to 23d. As the readers of the Archæologist are mostly interested in anthropology, I will confine this brief article to a consideration of the papers presented to Section H.

The members assembled Thursday afternoon, the 18th, and listened to the address of the sectional President, Dr. J. Owen Dorsey. It was one of the ablest addresses ever presented to the Association.

Friday morning general papers were presented. Those of special interest were: Indian Migrations, by C. S. Wake; A Purification Ceremony of the Mission Indians of California; Obsidian Implements; Stone Adzes:—by J. L. Rust; The Argillite Quarries of the Delaware, by H. C. Mercer; Cache Implement of the Saginaw Valley, by H. I. Smith.

Before taking up the papers which were read Monday, we will discuss those which have been mentioned. Mr. Wake's paper treated of the migrations of the American tribes something over two hundred years ago. He referred at length to Dr. Brinton's translation of the Lens-Lenape legions, and gave it as his conviction that the tribe of the Snake people built the mounds of the Ohio Valley. He discussed the Tellega, and placed them somewhat later than the Snake tribe.

Mr. Rust exhibited some very fine relics from California, and told of the great difficulty he experiences in getting them from the Indians. He said that the obsidian implements were considered sacred, as an evidence of wealth; that the Indians attributed to them supernatural power, and that the possessor of a large obsidian blade stood high among his kin-folks. Prof. Putnam took part in the discussion of the paper of Mr. Rust.

Mr. H. C. Mercer gave some new facts concerning the source of the material from which implements were made of in the Delaware valley. He has presented to the readers of this Magazine his discoveries and I will not say more concerning them here, save that they deal with a very important portion of archæology, and go far toward settling a number of vexed questions.

Mr. Harlan I. Smith has explored considerably in the region of Saginaw, Mich. He found several caches of leaf-shaped implements, and his description of these (followed by a paper by Dr. Snyder), brought out some interesting points on the presence of finished or unfinished objects in deposits. The implements which Mr. Smith found were not rough disks, such as Dr. Snyder and myself have found in large numbers, but were leaf-shaped, well formed, and gave every evidence of being completed when the ancient owner buried them in the ground.

Monday morning was the day set for the great debate over the existence of Palæolithic Man. This poor individual has been the subject of much discussion, and those of us who are "on the fence" as the politicians here say, are heartily sick of hearing so much said when neither side have much ground for evidence. As far as I am concerned, I would heartily agree with Mr. Volk, a practical field worker himself, who, after sitting through four or five hours of tedious discussion, whispered to a friend, "We should do more digging and less talking." Mr. Volk hit the nail on the head.

There were many men who took part in the discussion. Most of them were authorities, but some knew absolutely nothing, and should have kept out, as their evidence was of no value whatever.

Prof. Putnam was rather inclined to say less than the main participants, but made a vigorous defence of Paleoliths, when questioned by Mr. Mercer concerning his opinion as to their antiquity.

The great discussion was between Prof. McGee and Rev. G. F. Wright, both mentioned, Glaciologists. Their papers consumed about half an hour each, and most of us were of the opinion that Rev. Wright had the best of the argument. But when it came to the cross examination, a good many points were shaken by Prof. Chamberlain, of the Chicago University, who is himself a great authority.

Mr. Volk's paper on the occupancy of two periods of a portion of the Delaware Valley, offered some new and valuable field evidence. Mr. Mercer also read another paper, and Dr. Brinton and Warren Upham, another famous Geologist, took part in the discussion.

The existence of palæolithic man is a question which concerns Geologists more than any other problem in archæology, and it is not at all surprising therefore that the session of that Section of Geology largely attended the session of section H. The discussion in the afternoon became rather bitter and personal. We were all relieved when it came to an end. I think it resulted in great good to both sides, for it left many of them who had made rather rash statements in print, little ground to stand on. Every statement made by the one side or the other, which was not entirely true, was challenged. Great caution was shown by both contending parties. Personally, I think it will lead those who are opposed to the existence of such a Man, to regard the evidence as more valuable and conclusive. That it will lead Prof. Wright and his followers to accept nothing but absolute facts, to not generalize upon a few facts, and to search for greater evidences of the existence of Glacial Man. I do not think that the gentlemen shook that testimony for the existence of palæolithic man, but I do think that the nampa image and a number of finds made by incompetent discoverers must be set aside.

It was a matter of regret that Dr. Abbott could not attend and defend his Delaware Valley Ice-age Man. But although this individual may have had but few implements during his existence with which to defend himself, he never had stauncher friends than some of those who defended him at Madison, Wis. So the Doctor can rest serenely.

I do not wish to convey by these remarks the idea that the whole question of palæolithic man was settled. Prof. Wright, Dr. Brinton, Mercer, Upham, Volk and Putnam, all defended poor old palæolithic man heroically and to a large extent. They gained their points. But some things which they contested were lost. For instance, Prof. Putnam and Chamberlain debated the possibility of an implement falling down through the aperture made by a decayed root. If I might not mistake, Prof. Putnam stated that the hollows made by tree roots invariably filled up sooner or later by the earth falling down, or by the lateral pressure causing lumps to become detached from the sides of the aperture and thus filling the whole thing up. Chamberlain, on the contrary, said that not all holes in the ground caused by the decay of roots, filled immediately, or that it was impossible for an implement to fall down through them. In this statement he was corroborated by several gentlemen, and the defense lost the point. But enough of palæolithic man.

Tuesday morning Mr. Dorsey read two papers, one of them was about Cemetery and Con-Peru, and another concerning some finds on the Island LaPlata. Mr. Dorsey spent eighteen months for Prof. Putnam in South America, and not only his description but his collection from various Inca burying grounds, marks the finest exhibition of either published or other character in the whole anthro-pologie at the Exposition.

Dr. Dorsey read a brief paper upon Osage names of the eight cardinal points; Mr. Mercer read a paper which was published in the "Archæologist" two months ago; Dr. Snyder gave his description of flint disks from Illinois, which was read by the Secretary of the Section. The doctor has done well in preserving an accurate account of all large disk finds in Illinois. His paper was well received.

The usual number of poor papers were received and read, after the custom of the Section, by title.

Space will not permit me to enlarge upon some interesting remarks by Dr. Gastrow. Prof. Putnam and several gentlemen could not attend the meeting. Suffice it to say that in spite of the great attraction so near at hand, the Exposition, the Session, especially Section H, never had a more pleasant or instructive meeting. WARREN K. MOOREHEAD, Sec'y Section H.

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DISCOVERY OF ANCIENT ARGILLITE QUARRIES ON THE DELAWARE.

[BY HENRY C. MERCER, DOYLESTOWN, PA,]

The discussion of the Trenton gravel specimens has forced several important questions upon our attention. Where did the argillite come from with which the chipped objects were made? Granted that much of it was found in the river-bed in the shape of boulders and erratic blocks, whence had this material been transported by the river?

To learn that modern Indians on the Delaware quarried jasper and in the process of blade-making strewed the quarry site with "wasters," resembling in form the Trenton specimens, was to ask whether they also quarried argillite.

We had found argillite "turtle-backs" on the surface at the camp-sites of Gilmer's Island, Gallows Run, Ridges Island, and Lower Black's Eddy on the Delaware, but they lacked the final and convincing association with the quarry to prove their pedigree, and we still sought the whereabouts of the ancient pits, the refuse heaps, and the "rejects" or blocked-out implements which were to repeat in the now famous blue stone, the story of the inchoate blades of jasper.

The way towards an answer to one of the vital questions that concerns the antiquity of man in the Delaware valley was opened on May 22, by the discovery by me of a series of seven or eight depressions surrounded by masses of argillite chips (a quarry in fact with all the surface characteristics of Macungie, Vera Cruz, and Durham, in America, or Grimes Graves, or Spiennes, in Europe) on the steep north slope of the hillside at Point Pleasant, Bucks county, Pennsylvania, on the right bank of Gaddis' Run, about one-quarter mile above its mouth and half a mile from the well-known Indian camp-site at Lower Black's Eddy. The work of carefully clearing out one of the depressions and trenching its refuse heap was begun yesterday afternoon and will occupy an indefinite time.

Notched in the slope whose angle is about 35 degrees, the depression, one of eight or nine others, fronts a solid ledge of argillite (an outcrop of the large vein here traversed and exposed by Gaddis' Run, and twice tapped near by, by modern quarries as the purest source of the material).

Its largest diameter is about thirty feet, its depth five, and breadth eight. The trench begun across its narrowest width, penetrating for 3 feet through loose yellow mould, has shown as yet nothing of importance beyond two bits of charcoal and broken (quartzite pebble) hammer-stones at a depth of one and one-half feet. Another excavation about three feet in diameter has entered the mass of refuse for four feet without reaching its bottom, and discovered at various points thirty-three "turtle-backs," twenty-five broken bases or points, and four hammer-stones. On the surface about the other pits I gathered in a few hours twenty "turtle-backs," six ends or points, and fourteen hammer-stones.

With the work of penetrating to the bottom of the refuse, and studying the ancient quarrying process scarcely begun, I have hardly had time to more than think of the important questions suggested: Who made and worked the quarry? Will it show a successive series of occupations? Can it be connected with the village site at Lower Black's Eddy? What shall we say of these rudely chipped forms? Are they "wasters" and do they of all "wasters" yet heard of, resemble the Trenton specimens?

We are twenty-five miles above Trenton and at the largest and purest outcrop of argillite on the right river bank above that place. The bed of Gaddis' Run and the river-shore below its mouth are thickly strewn with argillite blocks and water-worn boulders—a pathway, in fact, littered with blade material, extending, from the ledge above referred to, to the Indian camp half a mile distant. While the significance of this has been obscurred by chipped fragments from the modern quarries fallen into the stream, and the stone dressing that has accompanied the building of a dam, two bridges, and a canal aqueduct, there can be little doubt that the inhabitants of the village often went no farther than a few hundred yards along these beaches for their material.

But too much hangs upon the further examination of this site and the neighboring camp, now at last unfolded to the student in its fuller significance, to warrant a premature word.—SCIENCE, Vol. XXI, No. 540, p. 317, June 9, 1893.

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THE EARLIEST EXTENSION OF THE IRON AGE.

In these notes (SCIENCE, March 10) I referred to some recent studies on the early Iron Age in Central Europe. The question still remains, When and how did the art of working iron reach those localities? Two valuable papers of late publication have interesting suggestions touching this point. One is on "Le Premier Age du Fer au Caucase," by M. Ernest Chantre, who for twenty years has travelled, studied and excavated in the Caucasus; the other by M. Louis Siret, scarcely less distinguished for his archæological campaigns in Spain. Some remarkable coincidences are pointed out by both.

M. Chantre finds that the most ancient sepulchres in Lower Chaldea which contain iron are shown by their funerary contents to be contemporaneous with the third and fourth dynasties of Egypt, at which period occur the first signs of this industry on the Nile. At the lowest, this would place them 2500 years, B. C. The knowledge of the metal reached the southern and central vales of the Caucasus about 1500 B. C., through the extension of a "Semite-Kushite" people, who were the ancestors of the modern Ossetes. They were distinctly non-Aryans, and the art of working iron was not introduced by them into Europe. Later on, about the seventh century, B. C., their culture was deeply modified by irruptions of Mongolic hordes from the east. (All this in spite of the fact that the modern Ossetes speak an Aryan tongue!)

The proof of this early Semitic influence is found in the identity of art-motives, decorations and methods, and especially in the numerous traces of the worship of the goddess Ishtar, the Astarte of the Phœnicians. In the Caucasus, as elsewhere, her favorite symbol, the dove, is constantly met with in ancient tombs; as is also that of the hand, employed in her rites as the symbol of adoration and peace.

It is true, as M. Chantre remarks, that in every station of the earliest iron age in Europe, from Greece to Scandinavia, we find figurines of birds, evidently sacred, and all to be traced to the dove of Astarte. They are proofs of what impressed M. Siret so much in his study of the earliest civilization of the Iberian Peninsula,—"the worship of a female deity represented under various symbols." He also, in his article in L'ANTHROPOLOGIE, 1892, No. 4, is forced by the results of his own excavations to assign this civilization to the daring early navigators of Semitic blood, to the Phœnicians, sailing from the far east of the Mediterranean, rounding the rocky shores of Spain in search of tin from the Cassiterrides, or amber from the far-off shores of the Baltic. The first signs of iron there follow without a break on a highly developed bronze period; and its earliest discovered use was as rivets to fasten together plates of bronze. This indicates peaceable introduction and artistic growth, not the result of violence and conquest. The merchant, not the warrior, was the civilizer.—DR. D. G. BRINTON, SCIENCE, Vol. XXI, No. 538, p. 287, May 26, 1893.

THE ARCHAEOLOGIST.

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J. R. NISSLEY, C. F. CAUSEY, M. D.

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EDITORIAL.

Joe Mulhattons.

Throughout this great and glorious land of ours are to be found a number of men professionally engaged as newspaper reporters who delight to belie and hoodwink their readers. The unfolding of a tale exagerated an hundred fold and embellished with impossibilities appears to be a favorite fancy of these knights of the quill. These "Joe Mulhattons" disgrace the profession in which they are engaged, and when found to be guilty of falsehood should be summarily dealt with.

The science of Archaeology has for some time attracted their attention, and they derive no greater pleasure than when preparing for the papers a story of a discovery pertaining to times prehistoric, which never has happened. Why the acme of their happiness lies in debasing and placing stumbling blocks in the path of this splendid and ennobling science is to the writer a very great mystery. Dollars and cents may however be the cause. They strengthen their productions by using the names of men and institutions who have done much to elevate the science and this was the case in the story of the discovery in Montana of a section of the vertebræ of a biped who must have been, when living 60 ft. high. Into this piece of Munchausanism were dragged the Smithsonian Institution and Oberlin college. It is a well attested fact that a human being more than 10 feet high can not live. During the past ten days the writer's attention has been drawn to the report of a discovery of a human skeleton somewhere in Europe whose owner during life attained a height of 25 feet.

Equally rediculous is the reported discovery, in Mexico, of a sort of Aœlian harp in the trunk of a tree, made by prehistoric people, which produced a noise so loud that it could be heard for a distance of four miles. Still another story from Kentucky is the unearthing of a number of human bones while digging a well, associated with axes of copper, very good brass and obsidian. With the bones was found the skeleton of a female around whose skull was bound a crown of silver set with an opal cut with skill and of large size and lustre. A lamp of brass into which was cut a curious inscription, Egyptian like, was also found. Even the scarab was engraved on it. A few weeks ago they contrived to find in some far away point in a western desert the remains of a building once upheld by columns so cut as to resemble a rattlesnake. The next discovery will certainly be a bona fide Egyptian city with all its magnificent columns, statues and obelisks. Can not these men make better use of their time? Can they not instead of hoodwinking their readers seek to tell the truth which always stands the test and never fails to elevate humanity? A. F. B.

BOOK REVIEW.

Lief's House in Vineland,

BY EBEN NORTON HORSFORD.

Graves of the North men,

BY CORNELIA HORSFORD.

Boston: Damrell and Upham, 1893. P. 40.

Much has been written about the Norse voyagers, who, it is said, landed upon American shores hundreds of years before the arrival of Columbus. While able writers are championing the cause of these ancient voyagers others do not admit that they ever reached our shores. The titles in the brochure given above are attempts to prove that the Vikings really landed in the immediate vicinity of Cambridge, Mass. From hints obtained from ancient Norse sagas Prof. Horsford commenced excavations on this spot and discovered remains indicating to him a civilization much in advance of the aborigine. He dicovered traces of large houses, huts, fishpits and canals. He also found soap-stone bowls, etc. and excavated the remains of a large building which has been called Leif's house. Near to these remains he unearthed a small marble cup, very much corroded.

Prof. Horsford tells us that he has not exhausted this archaœlogical field, but leaves to others the pleasures of unveiling the ancient works and early settlements which lie undisturbed in the near neighborhood. The paper is embellished with a plan of the vicinity where landed the Northmen and settlement on Charles river, and a sketch of the site of "Leif's house" at Gerry's Landing.

The second article by the daughter of Prof. Horsford is a story of further excavation done here, not alone among the remains of their houses but also of their graves. She discovered a second large house having two fireplaces built by a party who came here several years after the landing of Lief.

A number of ingenious ideas are brought forward in this production, which, to give here, may interest the reader. Miss Horsford arrives at the conclusion that the Huron-Iroquois tribes are descended from the Northmen and the natives. That the word "Shawnee" was a descriptive name given by the natives to the Northmen and that the Shawnee indians are probably descended from natives who came in contact with the Northmen from whom they learned how to construct stone graves. She will also have her readers believe that the rare obsidian relics found in the eastern part of the United States were not brought here from the Rocky mountains and Mexico but by the Vikings from Iceland. This reads well, but we know very well that the prehistoric people of the United States traded with each other, and that they travelled away from their homes great distances even as far as twelve hundred miles. Miss Horsford honors the memory of her father in following the path he would undoubtedly have taken. The paper contains numerous plans, plates and figures, and contains matter of great archaœlogical interest.

A. F. B.

CORRESPONDENCE.

Fake Archæological Stories.

ED. ARCHÆOLOGIST:

In your June number is an artical, or editorial, on a reported excavation of a large mound on the Columbia river in Washington near the city of Colville. One J. A. Frisbie, it was reported, had by the use of explosives demolished this large mound and found near the center a log frame containing a warrior and two wives with quarts of arrows, etc., as also many bronze implements.

I at once wrote to Mr. Frisbie, addressing my letter to Colville. It was returned. I then wrote to the County Recorder who informed me that no such person lived in the county: that no such mound had existed as the one described and that the whole story was the idle imagination of a newspaper reporter at Spokane, Wash. I wrote to the editor of the Spokane Review, the leading paper at Spokane, and received from him a letter as follows:

"Dear Sir: Mr. Miner errs in stating that the Review printed the story about alleged archæological discoveries in Stevens county. I recall reading the article in some Spokane publication, but do not remember the name. At the time the impression made on my mind was that the story was a fake. Now I have no doubt it was such. Very respectfully,
N. W. DURHAM, Editor."

This seems to settle the matter. You may now rest sure that the story was false and intended to deceive. Some "smart Aleck" wrote it to fill up space. But we do find bronze on the Columbia river and Aztec antiquities in great abundance: and our Puyallup and other Indians weave blankets exactly like the Navajoes: and there is such an affinity of languages, etc. as will surprise you some of these days.

Mrs. H. M. Kunzie of Seattle, Wash. during a twenty years residence at the mouth of the Umitilla river on the Columbia river has gathered a characteristic Aztec collection, including bronzes, metates, statuary, etc., and I am now gathering many more myself. I have no hesitation is saying to you that the Aztecs once lived on the Columbia river as well as on Puget Sound! I beg you to understand that this is not a "fake" story, but a statement based upon the finest collection of antiquities I have ever seen in a private collection.

The richest mine of American archæology lies yet untouched, and practically unknown, on the Columbia: the resting place of the Aztecs. I am respectfully, JAMES WICKERSHAN.

TACOMA, WASH., Aug. 6.

NOTES.

Considerable excitement has been created among the Pequots, the last of that historical tribe of Indians to the north of Mystic, in consequence of another attempt on the part of white men to rob their burying ground of the bones and relics of Indians buried years ago. The Indians discovered vandals at work upon a grave where, it is said, a descendant of Robin Casinment was buried.

Several half-breeds gave chase to the vandals, who fled to a sleigh near at hand and drove off in the direction of Lantern Hill country. The burying ground is near the middle of the Pequot reservation, with a rough, heavily wooded tract of land about one mile by two, in the south-west corner of North Stonington, some seven miles north of Mystic Bridge. For some time there seems to have been an unusual demand for Pequot Indian relics from some unknown source. Many rich finds have rewarded explorers in the Indian cemeteries in the vicinity in years past. If any one is caught trespassing in the Indian town cemetery now it will be at the risk of his life, for the Indians are said to be very angry. It is supposed that the demand for Indian relics comes from New York City.—HARTFORD CONN. TIMES.

* * *

A Puzzle for Future Archæologists.

Near Enon, in Clark County, Ohio, is a well-known artificial mound, commonly called "Prairie Knob," while the level tract on which it is situated is called "Knob Prairie." A former pupil of mine informed me that when he was a boy his grandfather sunk a shaft in the center of the mound down to the underlying black soil, without finding anything of consequence. The old gentleman was disappointed, not to say disgusted, to find his cherished landmark, which he had so long held in high esteem as the supposed receptacle of the regulation quantity of "Indian" relics, so utterly barren. He thereupon determined, in the generosity of his heart, that future explorers should not go unrewarded. He therefore deposited in the hole a miscellaneous collection of stone implements, pottery, shells, old bones, etc., such as he imagined a properly constructed mound ought to contain. This done, he carefully refilled the shaft, and restored the mound to its former appearance.

Imagine the sensation that such a find as this is likely to make when brought to light by some enterprising mound explorer of the twentieth century! CHARLES B. PALMER.

Columbus, Ohio. From Science Vol. xxi, No. 535, p. 246.

* * *

Cave-hunting on the Mediterranean.

Shortly after leaving the French frontier on the road which leads from Marseilles to Genoa, the tract penetrates by a tunnel the Baousse Rousse, or Red Rocks, the sea front of which is perforated with natural caverns looking out on the blue Mediterranean. They have furnished rich mines for the archæologist, as they were selected by the earliest of the human race who dwelt there as favorite resting-places for both the living and the dead. Fresh discoveries were made in one of the grottoes in February, 1892, of which a note will be found in Science, July 26, 1892, giving the opinion of J. Vaughan Jennings. A still more elaborate study was made by Dr. Verneau, which appears in L'Anthropologie, 1892, No. 5. His conclusions, briefly, are that the three skeletons found side by side were an interment dating from a period intermediate between the quaternary and the neolithic epochs: but it had been made in strata containing traces of an older and different industry, which could properly be called quaternary.

Some excavations of MM. Fournier and Riviere, published in Le Naturaliste, Feb. 15, 1893, revealed a station of the Magdalenian epoch in a rock-shelter at La Corbiere, near Marseilles, and probably as ancient a relic-bearing stratum as has been found in that district.

A curious fact about it was that at the remotest corner of the small grotto was a skeleton, the bones in place, but with no signs of interment, and no funerary objects. Evidently the corpse had been left to decay where the man breathed his last. Either he lived alone, or the others had deserted the grotto on his death. The authors refer to another such instance in another shelter. Probably in these, we see the signs of that horror of death which is one of the earliest prompters of the religious instinct. Tribes are known to history who deserted the dwelling and the corpse within it, when the owner died.

* * *

A Chemical Test of the Antiquity of Bones.

The effort was made by M. Adolphe Carnot last summer, in a paper read before the Academie des Sciences, Paris, to establish a chemical measure of the antiquity of bonea. He claimed that this is shown by the amount of fluorine they contain. Its relative proportion increases as the bones are older. Representing the maximum by 1, modern bones show but .06, those from the old quaternary strata .35, those from the tertiary .64. Hence, when human and other bones are found in the same strata, and the question whether they should be assigned to the same age arises, analysis is claimed to offer a solution; and M. Emile Riviere had recourse to it as the crucial test in the disputed age of some human bones found along with those of extinct species in the gravels near Billancourt, on the Seine; proving, he believed, that the human bones were intrusive and late.

It seems to me, however, that this test, which I learn about from an abstract in the Journal de l'Alliance Scientifique, March 15, is open to some serious risks.

Not only do the inorganic constituents of bone differ largely in the different osseous tissues of the same skeleton, but they notoriously vary greatly at the different epochs of life. According to the analysis of Heintz, the fluoride of calcium in the average femur of an adult is about 3.5 of its inorganic constituents. Where the proportion in ancient bones differs notably from that in modern, how can we decide what part of it is owing to post mortem changes conditioned on the quality of the soil, the amount of percolation, the length of exposure before inhumation, and like incidents? While it would be most desirable to have at hand a positive chemical test of antiquity, we must hesitate to accept as conclusive one which seems exposed to be influenced by these precarious conditions.—Dr. D. G. Brinton, in Science, Vol. XXI, No. 536, pp. 261-2.

* * *

Flint Implements.

A Danish archæologist, G. V. Smith, has been experimenting with the use of the complex flint implements. He fitted handles to the flints and worked them upon pine with complete success. He was convinced that the same flint hatchet would work equally well in harder woods. With these primitive tools it would be possible to bring down large trees and execute all kinds of simple carpenter work.—American Antiquarian, Vol. XV, p. 127, March 1893.

* * *

Stone Arrow and Spear Heads.

In the foothills and canons of New Mexico and Arizona I have often come upon small areas, from six to a dozen feet in diameter, thickly strewn with flakes and chips of flint, quartz and the black volcanic glass called obsidian, says a writer in the New York Advertiser. Among these chips I have found stone arrow and spear heads and other implements, in more or less perfect condition, indicating that these places were the sites of the workshops of our barbarian antecedents in the occupation of the country. But that is all past. The Indians of to-day have become skilled in the use of more effective weapons and implements, and those of stone have gone out of fashion in the United States. It was not until very recently that I had an opportunity of visiting one of these primitive armories operated in an Indian village in central Mexico and of watching a weather-beaten, wrinkled old man plying the vocation of chipping out of stone these odd knives, arrowheads and what not with a consummate skill.

Obsidian is quite brittle as compared with other varieties of stone used in this manufacture. It is comparatively easy to chip this material into shape if one knows how. A strong T-shaped instrument is made of hardwood, the body about twenty inches in length, the cross piece ten inches or a foot long. Seating himself upon the ground, the workman selects a bit of stone to suit his purpose, places the cross of the T against his breast, the lower end of the body held and guided by his left hand, while in his right hand, clamped viselike between his knees, he holds a piece of obsidian.

Placing the lower end of his wooden instrument against the stone, he gives a sudden, quick, strong pressure of the body against the T, which results in splintering off a flake of the brittle material. The operation is repeated again and again with the greatest nicety until the stone is reduced to the desired proportions. Every Indian is not his own armorer or artisan. It requires long practice to attain the necessary skill and usually one or two of the men act in the capacity of implement-makers for an entire village, and they seem to find it a profitable industry. The stone used is carefully selected and is often brought long distances to the workshops. I have found heaps of obsidian chips in localities very far removed from the nearest place where the mineral is found.

ODDS AND ENDS.

J. R. Nissley is collecting in the Southern part of Illinois and reports some rich finds.

Wm. J. Seever is in charge of the Missouri archæological exhibit at the Columbian exposition.

The Missouri Historical Society has a large and fine exhibit of flint implements at the world's fair.

We were recently show a unique silver ring by Prof. O. J. Craig, of Purdue University, which was once the property or Mrs. Sitting Bull.

The world's fair Cliff Dwellers exhibit, by the H. Jay Smith Exploring Co., near the Anthropoligical building, is well worth seeing. It contains hundreds of relics of bone, stone, pottery, mummies, etc.

We would like to hear from more of our readers relative to finds and explorations made during the season. such letter are always interesting and instructive. Therefore do not hide your light under a bushel but let it shine for all.

If you know of persons interested in archæology that would be likely to subscribe, please send us their address and we will mail them sample copies. Remember that the larger our subscription list, the better periodical we can afford to give you.

Those of our readers visiting Chicago during the fair should not fail to visit the curiosity store of L. W. Stillwell, 76 Washington St., where they will find a large and varied collection of Indian relics, minerals, fossils, cut gems and a variety of other curio.

A. C. G.

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I will exchange flint and stone relics for standard historical books. Archæological and other scientific works. Give name of author, condition of books and state your wants. All communications answered. L. V. Mc Whorter, Berlin, W. Va.

For Exchange.—Documents on Paleontology, Geology, Archaeology, Ethnology, Artic Regions, Surveys, etc., for similar publications. What have you? What do you want? Address, Book Exchange, Toledo, Ohio. Dealers in second-hand books, please send catalogues. tf

The Archæologist.

VOL. I. WATERLOO, INDIANA, OCTOBER, 1893. NO. 10.

BURIED DEPOSITS OF HORNSTONE DISKS.

[BY DR. J. F. SNYDER, VIRGINIA, ILL.]

(*Read before Section H of the American Association for the Advancement of Science, at Madison, Wis., Aug. 20, 1893*

From the recent researches of Mr. Warren K. Moorehead in Ohio we learn that in a certain ancient Indian mound situated near the North Fork of Paint Creek, a tributary of the Scioto river, in Ross county, over 8,000 ovoid disks of dark colored flint, known as "hornstone", were found buried at its base. Messrs. Squier and Davis, who, in 1847, were the first explorers to disturb the integrity of construction of this primitive sepulcher, describe it as having in its composition two stratas of sand, separated from each other by a foot or more of intervening earth, and continuous throughout the structure to the ground; and that those mysterious seams of sand had, to that time, remained unbroken.* Mr. Moorehead, who subsequently removed the entire mound, verifies the statement so far as relates to the sand stratas beyond the excavations of the first explorers, and adds the fact that this mound, as well as all the others in that group, had "been constructed on a hard burnt floor", and that on this floor prepared by fire the flints were found "lying in little pockets or bunches of twelve to fifteen each, with layers of sand between each mass".†

In the Annual Report of the Smithsonian Institution for the year 1876 I published an account of two deposits of similar flints found buried on the banks of the Illinois river. The first of these, discovered at the village of Frederick, in Schuyler county, in 1860, comprised about 3,500 flints; the other, found in the city of Beardstown, Cass county, on the opposite, or east, side of the river, four miles lower down, contained 1,530. The disks, in both, were buried in the ground five feet below the surface; and neither deposit was marked by mound, or other discernable object or sign to denote their place of burial. In the deposit at Frederick the flints were brought to light by the bank of a small rivulet falling in after a freshet; but, unfortunately, no notice was taken of the arrangement of the disks in their burial. In making the deposit at Beardstown a pit shaped like the flints, with apex up stream, had been sunk near the river's edge, five feet in depth, down through the sand to the underlying drift clay (loess). The flints were laid in this pit in five courses separated from each other by layers of clay two inches in thickness; and in each course the disks were carefully placed with their pointed ends up stream and overlapping each other as slates are arranged on a roof; and the pit was then filled with sand. In neither of these burials was there any indication of the action of fire either above or below the flints. The deposit at Beardstown, which I closely examined throughout the process of its exhumation, presented every appearance of having remained there untouched for a great length of time. Many of the flints were heavily encrusted, and others firmly cemented together, with calcareo-ferruginous concretions, almost as hard as the stone itself, derived, by percolation, from the enclosing clay.

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*Ancient Monuments of the Mississippi Valley, p. 158.

†Primitive Man in Ohio, W. K. Moorehead, 1892, pp. 186-190.

A third deposit of hornstone disks, about 1,000 in number, was found, several years ago, at the base of a mound in Union Co., Ill., near the Mississippi river, by Mr. Thomas M. Perrine, who published but a meagre account of his discovery. I am not positive as to the exact number of flints in this deposit, but many of them that I have examined were precisely similar to all the others heretofore mentioned. It is to be regretted that Mr. Perrine paid no attention to the structure of the mound, or to the disposition of the disks that it covered.

All of the 14,000 disks taken from the Ohio mound and the deposits in Schuyler, Cass and Union counties, Illinois, with the one exception mentioned by Mr. Moorehead,* are in every essential respect identical. Some in each lot are more neatly finished than others, a few are circular, while others are oblong and rounded at each end; but all were chipped to a cutting edge all around, and none had ever been used, The type pattern aimed to be followed in their manufacture, and to which the great majority of them conform, is the mulberry leaf, rounded at the base and more or less pointed at the apex. From their striking similarity of shape, uniformity of size, and sameness of material; and from the lithological identity of the few unbroken nodules of dark flint found in each deposit, evidently placed there as specimens of the stone from which they were worked, the conclusion is irresistable that they were all derived from the same locality and made and buried by the same people.

In the summer of 1890 I partially explored one of a group of very interesting mounds situated in Brown Co., Ill., on the west side of the Illinois river, thirteen miles below Beardstown, It was thirty feet high, one hundred feet wide and one hundred and eighty feet in length. A pit fourteen feet square was sunk in its middle down to its base and then trenched out to one side, and tunneled under in places, by which an approximate knowledge of its entire structure was gained. The series of mounds to which this one belongs, five in number, were built on the alluvial river bottom, of clay brought from the bluff a hundred yards to the west, and three hundred yards from the Illinois river to the east, where its channel was at that time, now marked by a chain of sloughs and shallow lakes. The bed of the river at present is nearly a mile farther away to the east. The builders of this mound, the largest of the five, in commencing its construction, had first laid down an oval-shaped bed of clay on the sandy soil, twenty feet in width, thirty in length and two feet or more in depth with saucer-like depression of surface. On this clay platform fire had been maintained until it was burned hard for several inches below the surface, and its concave top was filled with ashes in which many fragments of charred human bones were observed. After the fire had been exhausted and the bed of ashes cooled there was laid upon it a mass of hornstone disks covering its whole extent a foot or more in thickness, and apparently placed as those were in the Paint Creek mound, as observed by Mr. Moorehead, in lots of fifteen to twenty, with sand between each lot as though to keep them isolated. Among the flints were two entire nodules of the raw material and several others broken in pieces. From this deposit 6,107 chipped disks were taken out, without positive assurance that the store was yet entirely exhausted. The flints from this mound are, in the average, smaller and of ruder and inferior workmanship than those of either of the other deposits mentioned, but the stone of which they are made is the same, and in outline they present, in the main, the same mulberry-leaf figure. This identity of material and type, and mode of burial, together with the same kidney-shaped nodules of dark flint with yellowish-white patina envelopes, as found in all the other large deposits, point unerringly to a common origin of all and identity of ethnic impulses inspiring their fabrication. Upon this mass of flints had been spread a stratum of clay ten inches in thickness, and on this another glowing fire had been continued for some time in which were cremated many human bodies, or skeletons. With the numerous pieces of burnt human bones we found several large marine shells, sheets of mica, spool-shaped ornaments of copper and a half crescent of hammered copper, bone awls, broken pottery, stone celts, flint arrow and spear heads, necklaces of marginella shells and of the large incisors of bears partially drilled for the insertion of stone settings, and other objects, but all so broken and calcined by the intense heat that only a few could be restored and preserved. The fire seems to have been extinguished by covering it with clay, and the whole pyre was then enclosed with huge logs that had long since disappeared leaving only dark streaks of vegetable dust at the bottom of their empty casts in the dry clay. Finally, over all, the immense mass of clay had been carried from the bluffs and piled up to form the mound that must have been forty feet high when first completed.

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*Primitive Man in Ohio, p. 189.

The quarries from which the hornstone nodules for making all these disks were obtained, and the location of the open-air workshops of the ancient artisans who broke them and chipped the broad fragments into prescribed forms have not yet been discovered. No flint of this character has been found, in any quantity, within the limits of the state of Illinois; nor in any geological formation of Ohio. Consequently this aggregate of 20,000 flints were transported perhaps several hundreds of miles after all the vast labor of their production.

In considering this class of American antiquities the suggested inquiries are: For what purpose were they made? And, what motive could have prompted the stupenduous labor of quarrying, cleaving, chipping, transporting and burying such surprising numbers of them?

An apparently plausible hypothesis advanced in solution of these questions is that the disks are but "roughed-out ingots" cached in the ground for concealment and safety and to preserve the better cleavage properties of the stone, to be withdrawn when needed and reduced. by further chipping, to finished implements. A little reflection however will raise serious doubts as to the correctness of this theory.

On the threshold of this discussion we must bear in mind the many small deposits of flint implements found in all parts of the Mississippi valley, placed in the ground by nomadic people, without order or ceremony, for the very obvious purpose of concealment and safety until necessity again required their use. Some of these hidden articles are plainly unfinished blades, of chert or white flint, intended to be worked over when convenient. Others are broad, flat, well finished implements of hornstone, very similar to the disks before described but smaller, and always bearing marks of long continued and hard usage.* The number of flints in all these unquestioned temporary caches is generally limited, and in but few instances exceeds in weight what one person can easily carry. They were buried but a short distance below the surface and were probably at the time of hiding enclosed in bark or other perishable material. The caches of well-worn hornstone implements referred to are found invariably near water courses. The flints are of the same mulberry-leaf pattern as the disks in the large deposits, and, in my opinion, were simply canoe-making tools stored in the ground, after the completion of a "dug-out", for safety until again wanted for similar use. My reason for this belief is that many years ago I saw Indians on Snake river, in Oregon, make stone implements of exactly the same form and proportions as these, of hornblende, or aphanite, which they employed in scraping down and removing the charred and loosened wood in the process of canoe-making by hollowing out the log with fire. When the implements became dulled from use they were rechipped, or sharpened; and this was repeated when necessary until in time the stone became materially reduced in dimensions.

The makers of gun flints, a century ago, learned by experience that flint chips most easily when newly quarried, or when kept damp and excluded from the hardening action of the atmosphere; and so, they stored their raw material in tanks of water, or buried it in moist ground, until wanted for manufacturing. This knowledge, and the additional fact that none of the disks in the large deposits were ever used, are relied upon to sustain the idea that the disks were only "roughed-out", and the deposits no more than temporary hiding places.

The artistic status of the disks may remain in a great measure, a matter of individual opinion and judgement. Different degrees of mechanical skill are shown in fashioning them: some are exceedingly rough, but many are as nicely proportioned and finely chipped as are the best class of flint implements. A critical examination of them by any competent archæologist will, I think, convince him—as the examination of thousands of them has satisfied me—that each flint is finished and complete for its intended purpose.

A moment's thought will dissipate the notion that their burial was intended to preserve the chipping properties of the stone; for we know that the position of the thousands of them in the Paint creek and Brown Co., Ill., mounds was absolutely anhydrous, and their receptacles there had been previously dried by fire, and their environments were intentionally arranged so as to render it almost impossible that they should come in contact with the slightest dampness.

On the assumption that the great deposits of disks were only cached for present convenience, what explanation can be given for the singular care and ceremonious observances of their hiding? Why should their places of concealment be prepared with fire? And why should the stratas of sand be introduced in their covering on Paint creek: and human bodies be burned upon them in Illinois? And why should mounds of such magnitude over them be necessary to insure temporary safety?

Again, supposing the disks to have been stored in their earthen warehouses to be withdrawn when needed, and were so utilized, we should find gaps in the deposits where some had at different times been extracted. But such has not been the case. Mr. Squier and Mr. Moorehead assure us that the sand stratas placed—as winding sheets—over the flints in the Paint creek mound had never been broken. The great deposits of these peculiar disks that it has been my fortune to examine in situ on the Illinois river bore unmistakable evidence of high antiquity, and the original integrity of their burial had certainly never before been infringed. I am reasonably sure that none of the flints placed there had ever been subsequently withdrawn to be "worked over".

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* Antiquities of Wisconsin. I. A. Lapham, 1853, p. 8.
Smithsonian Annual Report for 1872, p. 402.
Ibid for 1379, p. 436,

If the deposits had been only the hidden stocks-in-trade of enterprising implement makers carried to a distant market destitute of flint, (as is central Illinois), for trade or barter, we would reasonably expect the venturesome traders to have been well patronized by the dusky hunters and warriors there with whom flint was a prime necessity. And we would also expect the Illinois consumers of this imported hornstone to have left evidences of their traffic in local workshops where the "roughed-out ingots" withdrawn from the great mounds had been worked down to finished weapons; and, as a consequence, we ought to meet there, in the surface finds, many of the finished implements of hornstone. But, as yet, no such hornstone workshops abounding in dark-colored chips and broken or unbroken disks, have ever been found in the Illinois river valley: and, of all the surface finds of flint relics in central and southern Illinois less than three per cent. are of dark-colored flint and scarcely one per cent. is of hornstone. From this fact and the undisturbed condition of the deposits it must be inferred that, as commercial speculations, the importation of disks resulted in signal failures, none of them having ever been disposed of.

With this commercial idea in view, we would look with confidence for large deposits of hornstone disks in the Cumberland valley and throughout middle Tennessee, as fully eighty-five per cent. of all flint implements found in the stone graves, and on the surface, in that region are of dark-colored stone; those made of white flint being exceptional. But no deposits of "roughed-out ingots", as those in the Paint creek mound, have ever yet been found in that state.

Those who regard the great deposits of flint under consideration as only hidden stores of blocked-out raw material, to be further manipulated when necessary or convenient, must admit that as such they are unique and without parallel among American prehistoric relics. They must marvel that a people so provident and thrifty as to have wrought these thousands of "ingots" at the expense of so much time and labor and transported them great distances and cached them for future use, would not also have hidden away great stores of other kinds of raw material, as copper nuggets "in the rough" to be worked over when needed; or, of quantities of marine shells to be withdrawn at convenience; or, of blocks of mica to be extracted and exfoliated at leisure; or of "roughed-out" ingots of obsidian to be finished upon rainy days. But no magazine of such unfinished goods are ever found; and we must infer that the pre-Columbian tariff on raw-materials was prohibitory, hornstone disks alone being on the free list.

My own limited observations in the field, and all the mound-exploring literature to which I have access, establish—in my opinion—the fact, without exception, that no primal deposit of any kind placed at the base of a mound has ever been subsequently disturbed by the people who made it. Hence, I think, we may regard it axiomatic in the science of American Archæology that all original mound interments were, by the mound makers, considered sacred, and intended to be complete and final, never again to be reopened.

Then, in the light of the crude religious incentives—the spirit worship and demon propitiation, the vague hopes of blissful immortality, and the frenzied dread of supernal forces, factors in the nebulous ethics of all tribes of the aboriginal American race—that moved the mound building Indians to sacrifice in fire, without reserve, their choicest and rarest implements and ornaments brought from remote regions and wrought with wonderful skill—their splendid obsidian blades from Mexico: their shells from the far distant ocean; their finely cut plates of mica from the Appalachian or Rocky mountains: their celts and ornaments of hammered copper from Isle Royale: their pipes of exquisite designs sculptured from the most refractory rocks: their polished effigies and rings of graphitic slate: and, no doubt, their bows and arrows, rich furs and wearing apparel also, wholly consumed—objects which they must have prized next to life itself—we cannot, I think, escape the conviction that the motive prompting the making, transporting and burying of the hornstone disks to have been superstition and not economy.

My conclusions therefore are as follows:

The buried disks were finished canoe-making tools, but not for use in this world.

That this variety of flint, "hornstone", perhaps on account of its color and gloss, its ready fracture and uniform cleavage, its nuclei of quartz crystals or chalcedony, or its other instrinsic properties, possessed in the estimation of the mound-making Indians peculiar talismanic virtues.

That this stone therefore fashioned into canoe scrapers, they judged, would be most acceptable as votive offerings, to the mythical powers controlling the navigation of the streams or their supply of fish.

That their burial in the ground or in the mounds whether in commemoration of extraordinary events, or—much more probably—as propitiating sacrifices, was sacred and final.

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"THE BASIS OF AMERICAN ARCHÆOLOGY."—A PROTEST.

In the August number of The Archæologist, Prof. Cyrus Thomas, under the first above heading, announces the following conclusions as "a suggestion":

> "Those devoting attention to the archæology of Bible lands and classic regions have wisely taken history as the basis of their guide. The students of European archæology have, as a general rule, made the four ages: paleolithic, neolithic, bronze, and iron, the basis of their system. As America has no ancient history, and the four ages are manifestly inapplicable here, its archæology if ever reduced to a system must have some other basis than either of those mentioned. What is it to be? Contrary to my expectation when I commenced the study of our antiquities, I am now convinced that it must and will be LANGUAGE!"

He then sets out his reasons for his conclusions—exalting the study of philology over that of all its kindred sciences, and claiming for language the highest rank as evidence in the solution of those interesting and difficult questions relating to our aboriginal races.

No student of archæology, or of human history, ought to place a light value on the study of language. Words often contain history of the most precious kind, and truths to be found in no other place, and the study of philology must be pursued assiduously by the archæologist. When we speak of the study of philology, however, we are apt to have in our minds the systematic and highly successful examinations made of the polished and ancient languages of the Old World, between which and the languages of the Indian tribes of America there is a vast difference. The one is a system—the other is a jumble. Prof. Thomas' suggestion only relates to the latter, and therefore the usual notions of the study of philology must be abandoned and a new field entered upon. The Old World system will do us no practical good—philology in the Old World, and the separate study of the indiginous languages of the New World are different propositions.

The languages of the American tribes are broken into almost as many dialects as there were families; there are hundreds of stocks or branches; there are no remains of many of these, and many—most of the vocabularies are immature, uncertain and inaccurate. The Peruvians and many other tribes compelled conquered tribes to abandon their language and adopt that of the conquerer, and we may never know how many or what dialects or stocks—or languages, have been exterminated by this means. The first thing, too, that the European did on reaching the shores of America was to destroy the best part of the evidence—every book, map and picture, that might have served as a means of clearing up the darkness surrounding the study of American languages. Then, too, tribes have wholly disappeared prior to the advent of the European. How may the archæology of the "Mound Builders" and the "Cliff Dwellers" be understood if only language be used as a basis? Even Professor Thomas might be unable to repeat a sentence, or even a word, of their languages. What language will explain the copper mines of Lake Superior, or the wonderful ancient works of man from the mounds of the Mississippi to the ruins of Peru? How many races speaking different languages have worked on or around them, and disappeared before a word of their languages was reduced to writing?

Consider that no two men will or can write an Indian word alike; that vocabularies depend entirely on sound; that no certain standard exists; that the rules of pronunciation differ, and therefore the written sounds gathered by the German, the Spaniard and the Englishman differ; that languages are constantly changing; that no "crazy quilt" is so complex as American languages; that out of this mass of matter but little has been preserved, and that no systematic view of the whole can possibly be made. Consider the frailty of the material: its liability to be incorrectly written, and stupidly used, and one has a few of the objections, only, to the use of the native languages of America as the basis of its wonderful archæology.

Material objects ought to be made the basis of our archæological system—the mines of Superior, the mounds and stone relics of the Mississippi; the ruins of Arizona, Mexico, Central America and Peru; the unchangeable flint; the stone axes, metates, pestles, mortars, pipes, pottery, textile fabrics; the wonderful carvings of Palenque, and a hundred other temples of ancient America; and all the varied display of archæological richness, which is at all times certain, lasting and self evident.

On the Columbia River, at the mouth of the Umitilla, in the state of Washington, Mrs. Helen A. Kunzie has gathered a splendid collection of antiquities. One of her specimens is a handsome metate, exactly like the Pueblan, Mexican, or Central American. She also found in an ancient grave at this spot a beautifully cast bronze war-club, or sword, in the exact shape of those of stone, ivory and wood used by our Pacific coast Indians from Oregon to Alaska. Her collection also embraces stone statuary—one large piece being a man from the waist up, WITH A CROWN ON HIS HEAD; also obsidian knives, mortars, pestles, in short, a rare collection of antiquities. What race in that region today knows anything of metates, or bronze war clubs, or statuary with a crown? What language explains the presence of these interesting relics on the banks of this Achilles of rivers?

The northern origin of the Aztecs has long been argued from fragments of traditions left by them: others have even sought to draw some inferences from a similarity of the languages of Mexico and the Shoshonean country; but how can you escape the evidence of the very metates of Moqui or Gautemala; the statuary of kings; the obsidian knives, calendar stone, and a ton of relics of the unmistakeable Mexican type. The objects are the best evidence; they are unchangeable and are the same at all times and to all men. By a comparison of this splendid Kunzie collection with that of another region, conclusions may be reached that the study of the surrounding languages for nearly a century had not suggested. It certainly appears that a superior race of people once lived on the banks of the Columbia, and as we also find the same character of relics on Puget Sound it also appears that they lived on latitude 49° north—BUT LANGUAGE HAD NEVER DISCLOSED THIS FACT.

In speaking of the application of the study of language to the settlement of inquiries, Prof. Thomas says: "Apply this rule to the various sections of North America where the conditions are similar and such questions as 'Who built the mounds of the Mississippi valley?' 'To whom are we to attribute the Cliff Dwellings?' will at once be answered. There will be no ground left for such theories as that the Mayas or Aztecs were the 'Mound Builders'!"

I should say not! Neither would there be ground left for saying anything. No settlement of these questions could ever be reached by that rule, and if any proof were needed to show the utter folly of using language as the basis of American Archæology the above quotation furnishes it. To say that we may only study the "Mound Builders" and "Cliff Dwellers" from an examination of their languages, when they have none, is to say that the question must not be studied. To say that the certain system of archæology which may and should be based on the material objects of stone, earth, brick, bone, and other lasting substances, shall be set aside for the uncertain, shifting, suspicious and badly written vocabularies of our American languages is asking too much. It looks like an attempt to place the settlement of all these very interesting questions in the hands of a very few men, and to announce to the great army of wide-awake American archæologists that their labors are in vain. It is to say that the possessor of these extremely limited American vocabularies is, alone, the supreme arbiter of all archæological questions; and that if an examination of the vocabularies does not justify bronze, metates or mounds on the Columbia River, that they will not be considered even if produced.

I beg to suggest to Prof. Thomas that a system based on the lasting monuments of American archæology, such as the mounds, ruins, mines, stone implements, and other material objects, seems much more thorough, systematic and logical. This system should, of course, be aided by a careful study of both language and tradition, the importance of both of which should not be under estimated in American archæology. I cannot understand, either, the objection to the European division into paleolithic, neolithic, bronze and iron ages. I think these, together with the copper period, may well be adopted, not for one locality, possibly, BUT FOR AMERICA. To make language the basis, to exclude (as that would) that great army of intelligent workers, and narrow the list to the few around the bureau where the vocabularies rest; and to allow all others to look on in open-mouthed wonder while the oracle announces conclusions, is not in accord with the free school ideas of America.

TACOMA, Wash., Sept. 9, 1893. JAMES WICKERSHAM.

INDIAN STONE GRAVES.

In the month of June I was one of a party of four, to visit, what was to us a very interesting Indian burial place, of which I will give a short description:

They are situated on the banks of the Ohio River, in Beaver Co., Pa., about fifty feet above the river on a small plateau, which is covered with heavy timber.

The first graves we found were circular in form like No. 2. While we were opening one of these, one of the party found the principal one, or No. 1, after which, the first few minutes were spent in admiration, and in examining the plan, and construction of this "Palace of the dead" before we disturbed it.

The walls are three feet high, and each of the rooms are partly filled with stone, some of which may have tumbled from the walls, and some placed over the dead.

We explored four of these graves and found they did not dig into the ground to bury their dead, but placed them on the natural surface, and covered them with a little dirt, and then probably with stone.

We did not find much in these graves, a few badly decayed bones, two teeth that were in a better state of preservation; some pieces of pottery, similar to that found in this section, composed of clay and pulverized shells, but no stone or flint implements.

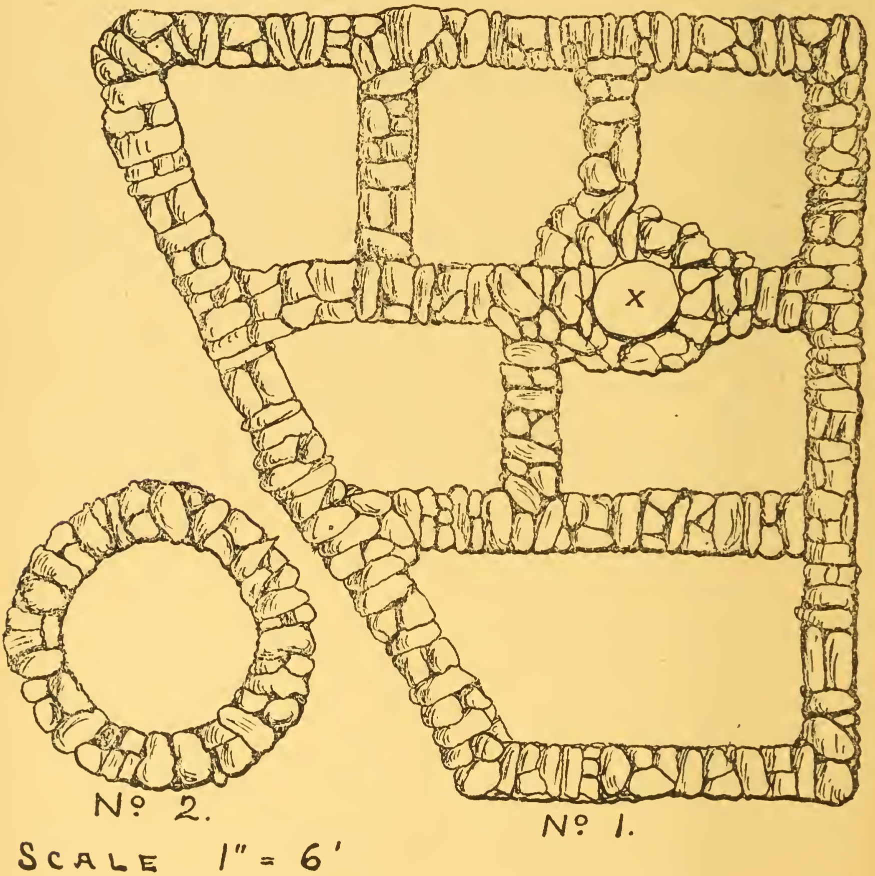
The fact of their not digging to bury their dead, and covering them with only a few inches of earth, and the fact of our finding no stone or flint implements, led us to believe that these graves were very ancient.

The circular place in No. 1, marked with an X, represents an ash tree two feet and four inches in diameter, which has grown up through the wall.

There are several of the circular graves, ranging from six to nine feet in diameter, and we hope in our further explorations, this fall, to find something more interesting to report in those already found.

We owe the preservation of these graves, intact, to the superstition of the people that own the land. They believe that there is gold buried in the graves, but were kept from digging for it, from the fear of coming face to face with the ghost of a Redman.

The way we obtained the privilege of opening them, was by offering to give them all the gold we found, and we would be contented with what was



of no value to them, and which they would probably not allow in their house.

There are a number of earth mounds in this section, but these are the only stone ones I have seen. H. D. CLEAVELAND.

BEAVER FALLS, PA.

MR. HOLMES'S CRITICISM UPON THE EVIDENCE OF GLACIAL MAN.

[BY G. FREDERICK WRIGHT, OBERLIN, O.]

Mr. Holmes has now concluded his series of reviews of the evidence of glacial man in America, having treated of the evidence from Trenton, N. J., and of that from Madisonville and Newcomerstown, O., in the first two numbers of The Journal of Geology, published at Chicago, and of the Little Falls evidence, in Minnesota, in the April number of The American Geologist. It is, therefore, an appropriate time to make some remarks upon his criticisms. This I will do with as much freedom from prejudice as possible, and I think I am in position to be as free from bias as one can well be; for all along I have been in a strait betwixt two, being under pressure from my theological predilections to discredit the evidence, and accepting it at first with much misgiving.

A calm review of the case in the light of Mr. Holmes's criticism seems to make it probably that we have been mistaken about the character of Miss Babbitt's discoveries at Little Falls. Mr. Holmes seems fairly to establish the probability that the discoveries there made were either in the surface deposits or in a talus of the bank which had fallen down from the surface. But I will leave this for further discussion by those who are more familiar with the ground.

In case of the discoveries at Trenton, N. J., however, his criticisms fall far short of discrediting the abundant evidence that had been presented by other investigators, and this I say with what I believe to be pretty full knowledge of the facts and conditions connected with the discoveries—knowledge which I have derived from numerous personal investigations upon the spot and from frequent conferences with persons who have from time to time reported discoveries. But, as the discussion of this evidence in detail will more properly fall to some others who have more immediate cognizance of the facts, I will do nothing more here than simply to express the convictions of my mind after repeatedly reviewing the evidence on the spot since his criticisms.

The last paper of Mr. Holmes, however, treats of the reported discoveries in Ohio, whose discussion more properly falls upon me. The two discoveries upon which most reliance has been made in Ohio are that by Dr. Metz, at Madisonville, in the glacial terrace of the Little Miami River, and that of Mr. Mills, at Newcomerstown, in the glacial terrace of the Tuscarawas. Mr. Holmes urges two objections to the glacial age of the implement discovered by Dr. Metz at Madisonville, and with him I understand Mr. Leverett to agree. The implement was found some distance back from the margin of the terrace, where the material was finer than that facing the river, and occurred eight feet below the surface of the loam, in the upper part of the gravel. Mr. Leverett suggests that this loam may have been deposited later than the main part of the terrace. I do not, however, understand him to have any direct evidence of this, but simply to suggest it as a possibility. I am confident however, that it is nothing more than a bare possibility, and that any separation of that portion of the terrace from that nearer the river is in the highest degree improbable. The glacial terrace is continuous from the river to Dr. Metz's house, and, according to the laws of the formation of such terraces, the finer material would be deposited back from the main stream in exactly the manner in which it is deposited there. We may therefore reject that supposition with a very great degree of confidence.

Second, Mr. Holmes and Mr. Leverett suggest that this implement may have worked down eight feet through the loam and into the gravel by the agency of upturned trees, or of the rotting tap-roots of oak trees. Prof. Chamberlain has suggested to Mr. Leverett that probably fifty generations of trees had grown upon this spot. But it is difficult to see how the number of the generations of trees growing upon the spot would materially affect the question. The most that Mr. Holmes claimed in reference to the Little Falls locality was that implements might have worked down by the upturning of trees three or four feet into the surface soil. But fifty disturbances of the soil to a depth of three or four feet would not have the effect of one disturbance of eight feet. To go half way fifty times does not produce the effect of going the whole of the way once. The suppositon of the implement's having worked down through a tap-root as it decayed seems to rest upon so slight a probability that it is scarcely worthy of consideration. The necessity of resorting to such hypothesis to explain away each item of proof in detail will impress most reasonable minds with the extreme difficulty of resisting the evidence presented in favor of glacial man in America.

With reference to the Newcomerstown implement, there can really be no better answer to Mr. Holmes's criticisms than to reproduce, with a few critical remarks, two paragraphs in which he unconsciously reveals the attitude of mind with which he has approached the question. The paragraphs are taken from his article in the second number of The Journal of Geology, pp. 158-159, in the midst of which there are injected two beautiful fancy sketches, illustrating how he supposed the banks might have appeared when the implement was discovered. Here are the paragraphs:

"Prof. Wright is entirely satisfied with the results of his efforts to corroborate the statements of the collector. He has examined and re-examined Mr. Mills, receiving every assurance of the verity of the find, but, after all, he really secures no additional assurance and can receive no fully satisfactory assurance that Mr. Mills was not in error. Prof. Wright has visited and photographed the site, and will speedily prepare a plate for publication, for just what purpose, however, it is rather hard to see, since the nature of the gravels is not disputed, and a volume of photographs will not give additional weight to the proofs. A photographs made of the tree after the bird has flown will not help in determining the bird. No more will observations on Mr. Mill's moral character, his education, or business reputation diminish the danger of error. The specimen may not have been found in place, notwithstanding all possible verification, and it may be a reject, notwithstanding its resemblance to foreign types, and Prof. Wright may be wrong in urging his conclusions upon the public, notwithstanding his painstaking efforts to secure all possible affirmative testimony.

"It is nowhere stated that Mr. Mills actually picked the specimen out of the gravels; it was probable loose when he discovered it, but, even if he could say that it was fixed in the gravel mass, the necessity of questioning the find would still exist. All the authentication Prof. Wright can possibly secure will not enable him to determine whether Mr. Mills struck with his walking-stick a small mass of the gravel in place at a depth of sixteen feet, or whether he was dealing with a mass which had slid with its inclusions of modern relics from the surface to a depth of 16 feet."

In a former communication to Science, (Feb. 3, 1893,) I had promised to publish a more detailed account of this discovery, accompanied with a photograph of the bank. It is to this that Mr. Holmes refers. The promised publication appeared in the Popular Science Monthly for May, simultaneously with the article by Mr. Holmes in The Journal of Geology. Doubtless it will strike the reading public rather strangely to have Mr. Holmes speak so slightingly of the value of a photograph of the bank showing it as it actually was soon after the discovery, when he has himself given two fancy sketches, representing an impossible condition of things, to inform us how he thinks it might have been. The photograph of the bank taken by Mr. Mills, within six months of the time of his discovery, exhibits its face intact, and is a part of the evidence presented as to what was the actual condition of the gravel when the discovery was made. The haste with which Mr. Holmes has plunged into this discussion is shown by his statement on a previous page that Mr. Mills had "published nothing save through Prof. Wright." The report of the Western Reserve Historical Society referred to by Mr. Holmes is entitled a report "by Mr. Mills and Prof. Wright," and the specific account of the discovery is given in Mr. Mills's own words, in which he says that when a space of about six feet in length by two in height fell down, it exposed the specimen to view. It is true that that statement is not so explicit as it should have been, and I have given, in the Popular Science Monthly, the fuller details as given to us upon the spot, and as repeated two or three times to me in correspondence, namely that the implement was seen by him projecting from the face of the gravel bank after the fall of gravel before referred to, and when the edges of the strata of gravel were all visible and undisturbed, and that he took it out with his own hands; or, if you want to avoid all error, that he worked it loose with his walking-cane until it fell out at his feet, when he took it up, made his notes upon it, and put it in his collection. Mr. Mills is as capable of drawing a section of the bank as Mr. Holmes is, and that he has done, but most readers will prefer to see a photograph . in which there is no danger of the incorporation of fanciful elements.

In view of all that Mr. Holmes has said of the importance of expert testimony, it is difficult to see, also, why he should say that observations upon Mr. Mills's moral character, education, and business reputation may not diminish the danger of error in such a case; for how else can you determine the danger of error in such a case; for how else can you determine the value of an expert's testimony? If there is doubt about his moral character, that of course vitiates the evidence in a high degree. So, also, if there is doubt about his ability to discern the difference between disturbed and undisturbed gravel in such a situation, that would largely vitiate the observations. But Mr. Mills's education and habits of observation are such that his evidence in so clear a case as this is, is as good as that of any expert could be. What does Mr. Holmes suppose led Judge Baldwin and the other members of the Western Reserve Historical Society to incur the trouble and expense of going down to Newcomerstown, except it was to inform themselves of the capacity of Mr. Mills to bear testimony to the very points at issue? Of course, we cannot force conviction upon the minds of the public, but we can get the facts of the situation and the conditions under which the evidence was given with all possible clearness before them. If any portion of the reading public chances to be in the attitude of mind in which Mr. Holmes asserts he is in when he says he does not care for a photograph of the bank, and does not care to know anything about the moral character and education of the witness, and that he is sure Prof. Wright cannot possibly secure a proper authentication of the facts, it will be a difficult matter to overcome the prejudice with which the subject is approached. But the number who are biassed to such an extent and are the subjects of such "invincible ignorance" is, I presume, not numerous.

Of course, I do not deny that there are things so improbable that they could not be established by any amount of human testimony. It is more likely that the senses should be deceived in some cases than that the things which seem to happen should really occur. But this is not a case of that sort. The existence of glacial man is not a highly improbable thing, and this evidence of Mr. Mills is in analogy with a vast amount of other evidence leading to a similar conclusion. There is nothing in the character of the implement, in the conditions under which it is reported to have been found, or in the testimony presented, to raise any serious suspicion of error. The fact that Mr. Mills was not specially impressed by the importance of the discovery at the time is not at all surprising, since his thought had been little directed to the phase of the subject involved in his discovery. He had in his collection thousands of other implements found upon the surface, and, after making note of the circumstances connected with the finding of this, it was laid with them·

In conclusion, I would simply add that in procuring, as I have done during the past season, some sections of the gravel in undisturbed condition for the exhibit at Chicago, I have had ample opportunity to study its behavior, both when it is in place and when it is in a recently formed talus, and, in reply to Mr. Holmes's assertion that it is impossible to tell whether Mr. Mills found this in the undisturbed strata or in the talus, I would say that the observer who could not tell the difference would be one whose testimony was utterly unworthy of consideration. While I am about it, also, I might as well refer to the fact that there is a slight discrepancy, which may attract the attention of some, both in my own and in Mr. Mills's statements about the depth at which the implement was found. In "Man and the Glacial Period" I say, that it was sixteen feet, In my original report upon it, I say fifteen feet. In the more specific details given in the Popular Science Monthly I say fourteen and three-fourths feet, and Mr. Mills has sometimes spoken of it as fifteen feet and sometimes as fourteen and three-fourths feet. It is easy enough to see why both of us should say fifteen feet, for that is a round number, but not so easy to see why in one place I should have said sixteen feet. But the discrepancy is not one that materially affects the evidence. I presume, therefore, that my error arose from the principle of assimilation with which we are so familiar in the textual criticism of the New Testimony. In the appendix to the third edition of my "Ice Age in North America," I give it as fifteen feet. But in writing the paragraphs in the latter book, I had just had occasion to speak of one of Dr. Abbott's discoveries which was sixteen feet below the surface, and the close association of the two in my mind doubtless led to the substitution, and, since there was nothing specially dependent upon it, the discrepancy being so slight, my attention was not arroused through all the subsequent proof-readings.—From Science, Vol. XXI, No. 537, pp. 267-68, May 19th, 1893.

* * *

Miss V. V. Dodge, of Washington, D. C., is one of the best known archeæologists. She has lately returned from several years' journey of investigation in South America, where she has made many wonderful discoveries relating to the art of the old prehistoric races.

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EDITORIAL.

Do Not Ask Too Much Of Us.

The editor has been made aware of the fact that some dissatisfaction is shown by Anthropologists, because in the Archæologist are printed the advertisements of dealers who wish to dispose for cash remains of pre-historic art. The complainants must certainly be aware of the fact that this journal DOES NOT PAY. Can its publishers then be blamed for trying to at least make enough money out of the project to meet all expenses? I think not. It is believed that those dealers who have advertised their wares in the "Archæologist" are honorable men. If it can be shown that they are not they will at once be dropped and exposed. The writer as well as the publishers would much prefer to see other advertisements coming in. Will our fault-finders put us on the track of the people who are anxious to pay for a notice which will be read by but several hundred readers? The writer asks this question as a man of business, which he is, and he begs leave to state as a business man that he would not. We business-men place our notifications in journals read by thousands of readers and not by hundreds. You, who are so ready to notice this little failing of the publishers, should at once lend the hand of charity and aid in placing the journal into the position where it need not print advertisements which are an eyesore to you.

Able archæologists have admitted that a journal of American Archæology should be established. There were none to undertake it, because the writer is certain none felt like investing money in a project, which when stock-taking time came would show a balance on the wrong side of the ledger.

Should not then the publishers of the Archæologist, knowing they would lose money, be commended for this kindly act? They have certainly done all in their power to make the journal worthy the kind feeling of all archæologists, students and collectors. So far many interesting papers have been printed and they are grateful to the authors for their consideration. Standing aloof and in silence are others who could, if they would send in valuable contributions which would aid in the elevation of the science of Archæology, and help to educate those who so much desire to gain knowledge. Come, gentlemen, place your shoulders to the wheel. Help us to make converts. You all know that there are but few persons who take interest in our science, and but for you many more would become students.

A. F. B.

CORRESPONDENCE.

A Card of Correction.

Editor Archæologist:

In the last number of the "Archæologist" several errors occur in my article entitled "The Meeting of the American Association for the Advancement of Science." These errors are due to a careless stenographer who sent off the original manuscript instead of the revised copy. For this error I beg the pardon of the readers of the "Archæologist." Some of the errors are very amusing, for instance the one on page 170 near she bottom. Of course many of the corrections suggest themselves to the readers. The "Lens-Lenape legions,"—of course should be the Lenape Legends. In the second line below the reference to the Lenape "Tellega" should be Talega. On page 171 in the paragraph refering to Messrs. Wright and McGee the beginning sentence should end with the words "both well known Glaciologists," instead of "both mentioned." In the paragraph at the bottom of page 171 there are a number of errors which were corrected in the revised article.

Upon page 172, about the middle of the page one should read "cemetery of Ancon" instead of "Cemetery and Con-Peru." At the bottom of the page mentioned Dr. Jastrow's name is misspelled. It should begin with J instead of a G. The sentence "Prof. Putnam and several gentlemen could not attend the meeting," is erroneous. Every one interested in the section was constant in attendance.

Once more craving pardon for the errors in the article, I remain,

Very truly yours,
WARREN K. MOOREHEAD.

NOTES.

A Very Ancient Manuscript.

Before Rome was founded (writes Dr. D. G. Brinton in "Science") the powerful federation of the Etruscans had spread an advanced civilization over central Italy, capping her hilltops with fortifications, whose impregnable walls still bid defiance to time. But by the beginning of our era, the Etruscan people, and language and religion, had disappeared, leaving no testimony but their tombs. From these some five-thousand inscriptions have been copied, but they tell us little. Not a single word of the language has been identified, beyond peradventure. The Etruscan religion profoundly modified that of Rome. They were a literary people, and in very early times wrote numerous religious books. These are referred to by Livy as works of divination, and by Cicero as books of ritual, or as Etruscan documents and even in the latter's day, they were in use by the Roman priesthood. It seems an incredible piece of good fortune that one such Etruscan Ritual Book should turn up in fair preservation in the year 1891; but such seems to be the case. Two or three centuries B. C. a mummifier of Alexandria bought a lot of waste paper and old rags for use in his business, and employed some of it in wrapping the corpse of a young lady. About 1849 her mummy was brought to Austria, and last year in her wrappings this Etruscan book was identified by Prof. Krall. The Vienna Academy of Science has undertaken its publication, and on its appearance I shall return again to its curious history and character.

* * *

A Mound Near Arkansas City Yields Some Interesting Relics.

E. S. Beavers, a well known farmer living near Arkansas City, in Cowley county, has made an interesting archæological find on his farm. He was engaged in digging a cellar. and in doing so he was obliged to penetrate an ancient mound which was located on the spot where he decided to dig the proposed cellar. On excavating into the mound Mr. Beavers found that it contained caves or recesses, which were about a foot and a half wide at the top, but which assumed wider proportions as they went down until they reached the bottom where they were about seven feet wide. The caves were about seven feet in depth. In them were found human bones, pieces of pottery, ashes and charcoal and one of them was found to contain large flint implements. These implements were deposited in a small cavity in the bottom of the largest cave. These flints are similar to some found in an Indian grave at Oak Mills several years ago, and they were in all probability used for cutting purposes.

The bones in this mound did not show any marks of fire, although they were badly decomposed and only small portions could be preserved. No complete skulls were found, but Mr. Beavers found an upper jaw containing five well preserved teeth. A great many fragments of pottery and arrow-points have been picked up on the surface around the mound.

The mound was located on a high ridge on the east side of Walnut river, and was about 200 feet above the river bed. The mound measured about 30 feet in diameter at the base, and was about four feet in height. It was composed of earth and stones, the latter being different from any stone that is found in the bluffs in that vicinity. They were evidently carried from a distance.

Several other mounds were explored on Mr. Beavers' farm but nothing of interest was found. There are three mounds that have never been explored. The caves or recesses found in these mounds make them different from any that have heretofore been explored in the state. Mr. Beavers is inclined to believe that these peculiar caves were constructed many ages before the period of the red Indians and he gives it as his opinion that they belong to the ancient cave dwellers' age. However, this may be, the mounds and their contents are very interesting and add another chapter to Kansas archæology. Cowley county affords a rich field for archæological research and it should be thoroughly developed.—Missouri Valley Farmer, Mo., May 10th, 1893.

Syenite Quarries at Assouan.

The only place in the East where syenite, or pink granite, is found in quantity is at Assouan, and from this quarry came the columns of the Greek and Roman temples at Constantinople, Rome and Baalbec. To get the proper idea of the size of the quarry, which has been drawn upon for material by all ages, it is best to ascend to its highest point, and to bear in mind that the sands of desert have covered its greater portion in later years. Near the top of the quarry is an opening containing a monolith 12 feet square and 100 feet long, detached and raised up, but not removed. In the long after years from the time it was detached, the attempt has been made to break the monolith in two by cutting a groove around it, but the brains and hands of the masters who detached and raised it were not there and the trial of simply breaking it was a failure. The quarrying of one of these monoliths was a work of time. The top of the quarry having been dressed off, the outline of the monolith was laid off. Around this outline a channel about two feet wide was chiseled and broken out to the depth of the monolith. The channel was cut with a gouge or half-round chisel, about half an inch wide. A grove six inches deep was cut on each side of the channel and the granite broken out between the two grooves. The chisel marks left on the side face of the quarry vary, but are about six inches high or deep. Some of the cuts are perfectly uniform, showing the good workman; while others are irregular, showing the apprentice's hand.

After the first cut was started, a second workman started in behind the first and took another six inch cut; this process was followed by others till the bottom of the monolith was reached. All around the bottom of the block, square taper openings, three inches apart, about three and one-half inches high by five inches wide, were cut wedge-shaped about six inches inward, after which each hole was wedged and the monolith split off. These taper holes with their sharp square corners are a marvel. Any mechanic trying to cut a square hole through a piece of cold iron with a hammer and chisel will appreciate what it means to make these openings after he has broken some of the chisels. From the fact that the monoliths left in the quarries lie at an angle, it would appear as if they had resorted to tilting and blocking to elevate them. In the lime-stone quarries they took a cut about twelve inches deep, and much coarser, as the material, being softer, permitted the use of a longer chisel or gouge; but with this hard, tough syenite, they had to use shorter chisels and take finer cuts. There is nothing in Egypt to prove the use of copper tools in stonework, but they undoubtedly had good steel tools. The conquerers who succeeded the Egyptians, having nothing but fanatacism and insolence for their portion, could not make a pound of iron or steel, and from that day to this have been destroying the works of the old masters, to rob them of the iron used in their construction. The result is that even the tools of the ancient workmen have disappeared.

In Egypt all work is done sitting down. They turn table legs and all other woodwork on a lathe on the ground. The work is revolved back and forth by a large bow, worked with the right hand, the gouge or chisel cutting only when the work revolves forward. The left hand guides the outer end of the gouge or chisel, while the inner end is held to the steady rest between the first and second toe of the right foot. The first and second toes of an old turner lengthen out beyond the other toes, and the space between them increases. They grow like the thumb and first finger, as they gradually assume their new functions.—Scientific American.

Hadrian's Villa.

After Trajan, Hadrian's name stands prominently forward in connection with the arts. He restored many of the ancient temples which were falling to decay; he erected others in a style worthy of the best ages of the art; he completed the temple of the Olympian Jupiter at Athens, and enriched it with a statue of the god in gold and ivory. But the most extensive of his works in relation to the arts was the construction and storing of his celebrated villa, about eighteen mile from Rome. It is almost impossible to read any account of ancient sculpture without finding some mention of Hadrian's Villa, for the sculptures discovered there have been immense. It will not, therefore, be out of place to see what sort of place this may have been in its best days.

This villa was built on the plain at the base of Tivoli, about eighteen miles from Rome, from the designs of the emperor, mainly to contain the treasures of art which he had collected. When first built it more resembled a city than a villa, for it is said by some antiquaries to have been eight or ten miles in circuit: but this statement is a lıttle too much for modern credence. But it is nevertheless certain that in no other part of Italy is there a mass of ruins of such amazing extent. Instead of being merely a villa, as we now understand the term, it comprised a lyceum, an academy, a pæcile, a vale of Tempe, a serapeon of Canopus, a stream called the Euripus, a library, barracks for the guards, elysian fields and numerous temples. Many of these were imitations of celebrated buildings or places elsewhere, and Hadrian seems to have wished to concentrate all the luxuries possible within this his unequalled country house. It was embellished with all the finest works that could be procured, whether the productions of ancient Greek artists or of those of his own time.

Some of the most interesting and valuable remains of antiquity have been discovered there, and even at the present day every fresh excavation that is made among these ruins restores to the world some object of interest.

Some of the Egyptian superstitions having been introduced into Italy about this time, they were mixed up with the existing forms of worship, and the gods of the Nile were admitted among those of the Romans. The example of the capital was soon followed by the smaller communities, and as the new worship was extended over the whole empire, a great demand arose for statues and other symbols of Egyptian deities and ceremonies.

The imitations of Egyptian figures and subjects which are found in Italy, and which particularly abounded among the ruins of Hadrian's Villa, may be assigned to this period. The numerous specimens of sculpture of the time of Hadrian that are preserved in modern collections are evidence of the high state of the arts. The statues and busts of himself and of the emperors who immediately preceded and followed him, as well as the portraits of Antoninus and Lucius Verus, exhibit qualities that would do honor to the best ages of Greek sculpture. There are two statues of Antinous in the museum of the Capitol, one treated in the Greek style, entirely naked, and the other with Egyptian attributes, which are particularly worthy of notice from the simplicity and beauty, united with grandeur, that pervade them.

It was by the orders of Hadrian that a change was wrought in a law concerning the portraits of private individuals, and which change led to the fashion of having portraits in statuary in the houses of all the noble and opulent citizens. In the villa at Tivoli, Hadrian placed the statues and busts of all his living and deceased friends.

The favorite architects employed by Hadrian in his great works were Apollodorus and Detrianus; but all attempts to discover the names of even a few among the many sculptors who must have been employed by him have proved unavailing. How far Hadrian may be termed the Pericles of Roman art it would be difficult to say without knowing the degree to which he encouraged native artists to add to stores already existing; but he certainly seems to have been the most munificent patron of art that Rome ever had. With him the great impulse ceased, and neither the patronage nor the skill seem ever after to have been forthcoming to so great a degree for the production of fine sculptures.—The Architect.

◆

The great Russian engineer Melnikoff, writes from Odessa to the Smithsonian Institution describing the ruins of an ancient canal discovered in Crimea, which he regards as one of the wonders of the world. It is certainly twenty-seven centuries old, and among similar ancient objects of historic interest is second in age only to the great Pyramids.—Washington Star.

R. M. W. Swan, who, with Mr. Theodore Bent, surveyed the ruins of Zimbabwe, is at present engaged in a systematic survey of other groups of ruins in South Africa, and he reports the discovery of a temple on the Limpopo, "oriented" to the setting sun at the solstice.

◆

Origin of Cannibalism.

Herr Henkenius in The Deutsche Sundschau, has an interesting paper on the origin of cannibalism, which appears to have sprung up among mankind after they had made up a certain social advance. The lower animals rarely devour their own species, and no traces of the vice have as yet been found among the relics of the paleolithic men. Some have attributed the practice to religious motives, but Henkenius thinks that hunger and the superstition about eating the heart or any other part of the enemy in order to acquire his courage were the original incentives, and that religious motives were a later development.

Continental Asia is remarkably free from cannibalism. In Polynesia and Central America it occurs chiefly in connection with religious rites, and in the former the eye of the victim is preferred. In Dahomey the human sacrifices did not lead to cannibalism. The Maoris forbade human flesh to women and viewed with abhorrence the eating of relatives. In many parts, however, the flesh of relatives is preferred.

◆

In the "Extra Census Bulletin" of the "Six Nations of New York," by Thomas Donaldson, Expert Special Agent, is shown a unique and interesting stone relic. It represents a sheep standing on which is seated a human shaped form holding at its side a smaller. Its history follows: "In the autumn of the census year John Bembleton, an old soldier of the Grand Army, while looking over the plowed sides of one of the Tuscarora mounds, discovered what the searchers from the Smithsonian Institution failed to find, a curious group of statuette figures cut from stone, much marked by age, and yet sufficiently suggestive of Abraham, Isaac, and the sheep to recall the theories of the redmen's remote antecedents. Aushing, so long with the Zunis, relates its history as far back as 3,000 years. The Indians recognize it as in harmony with some of their traditions. The suggestion that it was of early Jesuit origin is not borne out by the marks: which indicate a patriarchal beard, and are equally inconsistent with its being of recent manufacture. The illustration is from a photograph taken while the mold still filled the crevices." It is said to be an ancient Tuscarora religious relic. Ed.

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The Archæologist.

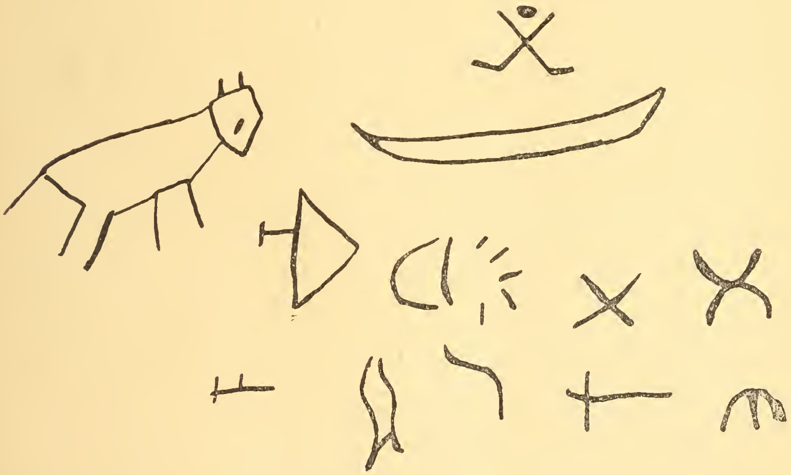
VOL. I. WATERLOO, INDIANA, NOVEMBER, 1893. NO. 11.

ON AN "INSCRIBED TABLET" FROM LONG ISLAND.

[BY DANIEL G. BRINTON, M. D.]

(*Read before the Numismatic and Antiquarian Society of Philadelphia, Oct. 5, 1893.*)

A few days ago Professor Gifford, of Swarthmore college, presented me a cast of an inscribed tablet lately found on an Indian site toward the east end of Long Island, and requested an opinion as to its genuineness. I take the opportunity to lay the supposed inscription before you, and in connection with it, to explain the general principles which should govern an archæologist in deciding upon the authenticity of such finds.



INSCRIBED TABLET FROM LONG ISLAND, N. Y.

Many such have been from time to time brought before the public. There was the famous Grave Creek mound stone, accepted by Schoolcraft but extinguished by Squier: then there are the Newark inscribed stones, the Rockford, Davenport, and Cincinnati tablets, the Lenape stone, the "Mastodon shell", which was exhibited at Madrid, and others, not to specify the rock inscriptions which have been reported and to some extent copied in various parts of the country. All these are asserted to be aboriginal work, and intended to convey ideas.

The present "tablet" is a piece of slate, six inches long, four and a half wide and (I am informed) about three-fourth of an inch thick. Both sides are inscribed with a number of rough figures, but the cast of one side is quite imperfect, or the stone itself is, so that I can be sure of the outlines on one side only. These are quite distinct, and I show them on the accompanying drawing.

Before proceeding to examine them, I will define the canons of criticism which I shall follow.

We are well aware that the Indian tribes of the eastern United States, especially those of Algonkian lineage, were acquainted with a graphic system, which they employed for recording facts, songs, myths, and legends. Numerous authentic specimens of this have been preserved. An early and interesting account of it was published by Dr. Edwin James in 1830, in his edition of "Tanner's Narrative". Since then, Schoolcraft in his large work on the Indian tribes, Copway in his History of the Chipeways, and various government publications furnish us ample material on which to found a correct opinion as to this method of writing.

In every such unquestionable aboriginal specimen we observe certain rules to prevail, without exception. The writing is not only pictographic, it is also symbolic and emblematic as well. Not only are some objects represented by pictures of them, but the same or other objects may be represented by a SYMBOL, that is, by something connected with the object: as when the Lenape indicated a turkey by the mark of its three toes, or a wolf by its rounded footprint; or by an EMBLEM, which is a picture of something in no way connected with the object, but purely allusive to it, through some process of mental association with which we may or may not be familiar. Thus, in the "Meday songs" as written down, a small paralellogram means "fire"; a circle with a dot in the center means a spirit, and so on. These conventional symbols and emblems belong to this method of writing, and when they are absent, or appear in unusual relations, it is enough to excite grave suspicions of the authenticity of an inscription.

The term "picture writing" as applied to this graphic method conveys an erroneous impression. These delineations were intended and are to be regarded as letters, not as pictures. The object of the artist was not to paint or draw a picture, but TO WRITE. Hence, we almost never find any true pictorial elements in this script. There is no shading and no grouping: that which artists call "composition" has no place in it whatever. Therefore, when we discover any of these esthetic elements present, we must look with serious distrust on the specimen. I believe it will certainly prove to be spurious. This is one of the chief reasons why I have never been able to accept the Lenape stone or the Davenport tablet.

This is an all-important distinction, as upon it turns the science of reading these inscriptions. In a genuine document of the kind there is no more connection between the figures than there is between the letters which go to form a word. The difference between them and the letters of our alphabet is this: in the Indian writing, each figure stands for a whole sentence, while in our alphabet each letter stands for a single phonetic element. This is carrying out the difference in the languages. In Algonquin, a whole sentence is expressed by a single word; while with us a number of separate words are needed.

When a "medicine man" reads off from his "meday stick" the sacred chants thereon inscribed, each figure calls up by association a whole line of the song. This he repeats often several times before proceeding to the next. There is no grammatical connection between them, though the same train of ideas is pursued. A given figure may contain several objects; as in one given by Tanner, in which are shown a hunting lodge, a pole placed crosswise, a cord from it, and a kettle on the cord. This was intended to call to mind the whole sentence, MOOSHKIN AGUWA MANITOWA, "I fill my kettle for the spirit": i. e. "I prepare to go forth on a medicine hunt".

It is obvious from this that anything like an alphabetic script in the proper sense of the word cannot appear on any of these inscriptions, and if present, condemns it as a fraud (as the Grave Creek stone). The same is true of the presence of art-motives which we know they did not possess, such as indications of landscape or perspective, correctness of outline or proportion, conventional old-world designs (as the forked lightnings on the Lenape stone), or of objects with which the natives were unfamiliar (as the mastodon on the shell).

All these principles are observed and carried out in the remarkable pictographic record of the Lenape or Delawares called the "Red Score", or WALUM OLUM, which I published some years ago, and which has been pronounced authentic by all the Indians to whom it has been submitted. It offers, I believe, an example of a genuine document of this nature: though I am ready to concede that it shows signs of "retouching", either by some educated native or by its finder, Professor Rafinesque.

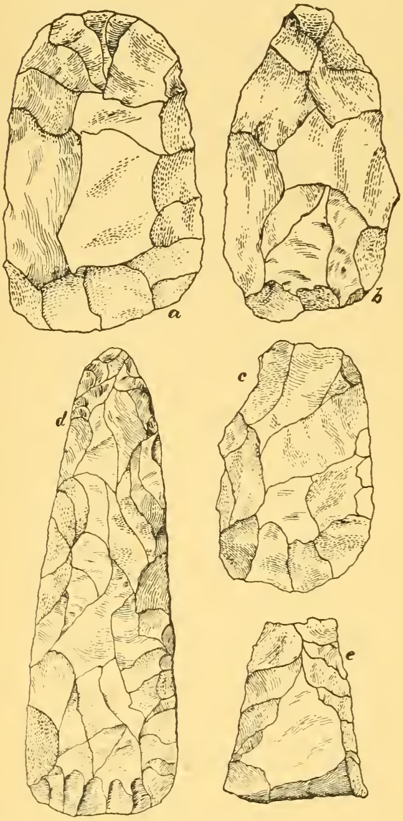
I shall not rehearse the criteria of a glyptic or lithologic character which should enter into the examination of such specimens; and still less into the question of the time, place and circumstances of their discovery,—further than to say in reference to the latter that in my experience the most palpable frauds in American archæology are those which have been established by the strongest array of affidavits and statements from "reliable gentlemen". I have learned not to attach the least importance to any such evidence, but to judge each specimen on its own merits.

Applying these rules to the inscription before you, I see nothing in it which excludes it from a probable genuineness. We see, beginning at the top of the diagram, the figure of a man; below it that of a canoe; then a line beginning on the left with a rude outline of a quadruped, perhaps a deer; a bow and arrow; the footprint probably of a bear; sign of a fire; an unknown figure; and in the line below, a fish, an eel, some vague lines, ending with the symbol of a wigwam. It seems to be the record of a hunting and fishing excursion, of little importance, which the writer may have amused himself in inscribing on a piece of stone simply because it was suited to the purpose; or, it may have been a mnemonic aid to retain in the memory the words of some hunting song or medicine chant, intended to propitiate the divinities who confer or deny success in fishing or the chase. Whatever it may have been, I see nothing in it to convict it as spurious; nor, on the other hand, anything to indicate that it was a record of a matter of moment.

NOTES ON NEOLITHIC FLINT MINES IN ENGLAND.

[BY G. F. LAWRENCE, M. ANTH. INST., ETC., LONDON, ENG.]

Mr. H. C. Mercer, in his paper on the Spiennes flint workings, mentions "wasters" of the Drift type; but says "that they do not occur at Spiennes".



(One half Size.)

A, B, C, Drift types Cissbury.
D, E, Neolithic axe, Cissbury.

I have just returned from a visit to the famous Cissbury workings and have found. side by side with flints of the true Neolithic axe form, finished flints of the Drift or Palæolithic types.

It appears to me that Neolithic man still made tools of the older form. for various purposes. I have several undoubted neolithic implements of the same drift types. found on the surface in other parts of England.

I found. buried in earth. at the top of the ramparts at Cissbury, an implement of the chopper type, Fig. 1. This form has been found in the drift gravels of Suffolk. the Thames. and other localities. see Evans' Stone implements Fig. 433. and no doubt was a most servicable tool in savage times.

I have also an implement found by myself at Cissbury in a layer of earth containing flakes, charcoal. etc., and just above a band of flakes. cores, chipped axes, etc., twelve inches thick: see Fig. 2: this implement is of the St. Acheul type. but being no doubt useful for digging purposes. was still made in late neolithic times. for underneath it, I found narrow thin axes of flint. of a type. probably made in the early bronze age.

There is much to be discovered at Cissbury yet: as at Spiennes (with one exception.) no polished implements have been found in the pits. but I have several fragments of ground axes from the adjacent surface. as though the grinding was done elsewhere. Scrapers also occur in the fields, but are very scarce indeed in the pits.

Knife daggers, curved knives. adzes, occur: but all broken in manufacture. cores, hollow scrapers for rounding bone pins. arrow shafts, etc., knives. sharp flakes,—I had some severe cuts getting them out—saws, picks. etc., are all found in the old workings. No arrow heads have yet been found in the pits. but a good one was picked up in the fields near. some two or three years ago.

Fragments of stag's horn picks are occasionally found, but are not so numerous, as at Grime's Graves, from which place I possess a fine specimen, Fig. 3. The drift forms also occur round the workings at Grime's Graves, I have several.

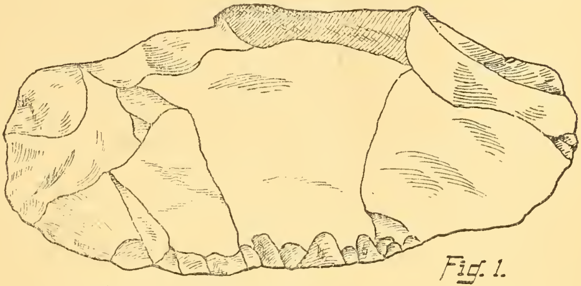


Fig. 1.

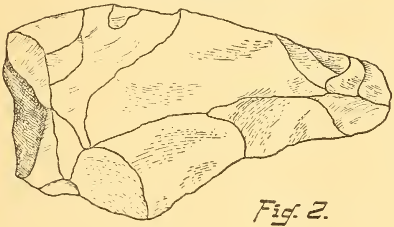


Fig. 2.

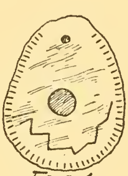


Fig. 4.

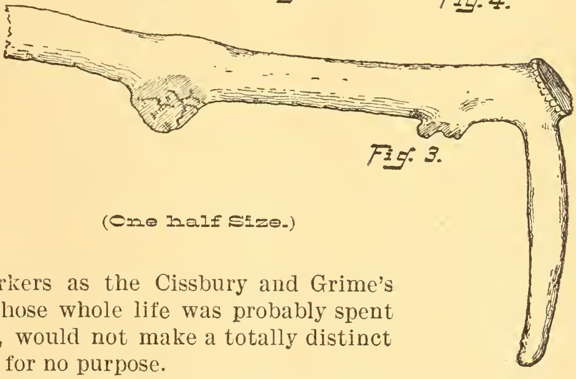


Fig. 3.

(One half Size.)

I have also two or three horn picks from the Thames, and no doubt a better acquaintance with such rude looking tools, would result in the discovery of them in many other places. I think enough has been said to show that the roughness and primitive form of a stone implement is no proof of its great age, for it was natural that no great trouble was taken in making a tool for rough work, which would soon be damaged or broken and then thrown away to be replaced by a fresh one; for such skillful flint workers as the Cissbury and Grime's Graves inhabitants, whose whole life was probably spent in making implements, would not make a totally distinct form, accidentally and for no purpose.

Note:—Some fresh chalk workings have just been found at Lavant, near Chichester, and I have been fortunate enough to secure a curious chalk pendant from there, Fig. 4, but as the excavations are only just begun, enough has not yet been found to prove them of Neolithic age. They were certainly inhabited in Roman times, for some interesting bronze pins, etc., have been found in the caves.

* * *

A PERUVIAN CEMETERY.

[BY GEO. A. DORSEY.]

The name Iquique suggests Salt Petre and Lord North (the Nitrate king) rather than the ancient empire of the Incas; in fact, it is famed the world over for its wonderful deposits of Nitrate but it is not generally known that back of the city is a small but interesting burial ground. We went there, having heard something of this burying ground in Mollendo, but for a week we inquired and searched in vain and it was only by accident that we finally found the object of our visit.

Iquique is one of the best known cities of South America and needs no description. I might state, however, that the city is built on the ocean's edge and back of it is a sandy desert over a mile in breadth. This desert is shut in by the low coast range, rising abruptly to a height of 3,000 feet. The desert is absolutely barren and present's no sign of life except that there may be seen, at any hour of the day, great clouds of white dust rising from the mule trains which bear the nitrate from the great plateau beyond. The desert is covered in the eastern portion by great sand dunes or medanos, which are crescent shaped, and with lines as distinct as the new moon, and are ever varying and shifting across the plain with the wind.

The town itself contains little of interest, existing solely as a shipping port for the Nitrate. The harbor presents one of the busiest scenes on the westest coast of South America. I have counted as many as forty ships riding at anchor, awaiting their cargoes of Nitrate, the majority being bound for Liverpool.

The foreign population of the city is quite large and is composed almost entirely of English.

We were about to despair or finding antiquities in Iquique, when a boy brought to our room some small pots and a few fish hooks which he said came from a "hucca". Upon investigating we learned that some workmen had unearthed human remains, while making an excavation at the back of his house. This was encouraging, indeed, and we eagerly set out with the boy to examine the place. He led us to a small house in the upper edge of the city, where, passing throug to the yard, we discovered the men at work.

After a few minutes negotiations with the owner of the property, we obtained permission to explore the lot. Here we worked for two days, and in a space about twenty feet square we discovered three graves, and took from them twelve mummies. With the bodies had been buried all objects used in life. These we found well preserved, and so, are enabled to form a very complete idea of the life and customs of these primitive inhabitants.

The method of burying entire families in the same grave, prevailed here as well as in many other places on the coast. One grave contained five bodies, a man, woman and three children. The burials were generally at a depth of four feet, or just beneath the guano which had been placed there in prehistoric times. I might mention here that the use of guano as a fertilizer was well known to the ancient peoples of Peru.

The preparation of the bodies for burial was very simple. The knees were drawn up to the chin and the hands were placed over the face. The entire body was then wrapped in various clothes and garments.

The grave consists of a circular hole, in the bottom of which is placed the body in a sitting posture. The covering for the graves did not consist of elaborate roofs of matting and rafters as are found at other places along the coast, but merely a covering of skin held up by four sticks. In many cases these sticks had given way, and in only one case did we find an entire skin in good state of preservation. The reason for this form of roof is easily explained for, as I said before, Iquiuue stands on a barren, sandy desert, and there is no wood within fifty miles.

In front of the body were placed the various implements and utensils which had been used in daily life. Thus, in front of the man we found his bows and arrows, a model of balsa or boat, his paddles, fishing tackle of various sorts, as well as pots and calabashes, still containing fragments of food. With the woman were buried small work baskets, resembling very much the work baskets of today. These baskets contained spindles, thread, needles, etc.

Two groups of the objects just named deserve special mention, for they mark a difference from the material found in the graves on the coast to the north of Iquique. The first group consists of a series of fishing implements which is very remarkable for its perfectness and completeness. At the head of the series is the spear. This consisted of a round shaft of wood about fourteen inches long and an inch in diameter. At the end is a well-made flint point, which is not unlike the arrow-points found in Ohio. It is bound to the shaft by cords. Set into the shaft and about three inches above the point is a barb made from the teeth of small seals, which are numerous on the coast.

The superior end of the shaft is sharpened and fits into another and heavier shaft of wood, from which it is thrown. Connection is retained with spear by means of a long leather thong or lasso.

Another form of fishing tackle consists of a hook made of a small piece of bone, about six inches in length. Near one end were fastened two pieces of cactus spine, an inch long, which served as barbs, at the other end was fastened the line.

The third form is wonderfully like our modern tackle. A long, firmly made line, a well rounded stone sinker and a copper hook. The latter is very similar to our "pin hook", and has no barb.

The second series of objects consists of the bows and arrows, which are very primitive. The bow is simply a round stick, about three feet in length and slightly sharpened at each end. The arrows are of light reeds, a foot in length and tipped with a row of feathers on each side. The point is a fourninch piece of wood, sharpened at both ends.

The pottery of Iquique is very similar to that found at Arica and is so well known that it needs no description here. In fact many of the smaller objects do not differ materially from those of Arica and it is probable that the peoples of the two localities were closely related if not of the same stock.

Another point of resemblance is found in the basket work of Iquique. One piece in the collection is especially well made and will hold water. The same manner of weaving has been applied in making a cap which is decorated with a feather plume.

Other objects included in the collection are sandals of raw hide, paint boxes with compartments for different colored paints, needles and pins of cactus spine, dried fish and corn, rough copper nuggets, carved wooden images and the desicated body of an infant wrapped in pellican skins.

A curious display of ingenuity is displayed in a piece of seal skin which has been patched by means of short cactus spines held in position by interlaced thread.

In conclusion it may be said that the ancient people of Iquique had not reached such a high degree of civilization as those living on the central and north coast of Peru. Whether this was due from a lack of sufficient time in which to develop, or whether the conditions of life were too unfavorable for a high culture it is difficult to determine. The latter theory, however, seems more probable.

PREHISTORIC SCULPTURES OF THE MISSISSIPPI VALLEY AT THE FAIR.

In studying the development of sculpture among prehistoric peoples at the Fair one was compelled to examine many collections and to visit Guatemala, Illinois, United States Government and Anthropological Buildings, as each of these contained large and important exhibits. But if one confines his study to the Valley named above, the Illinois and Anthropological buildings contain nearly all the required specimens. It was first necessary to acquaint one's-self with the management of the exhibits in the last named structures and then look for specific objects later. The grouping of the displays was exceedingly poor, the official catalogues worse. Fortunately the guards were numerous and intelligent, and several gentlemen in constant charge of exhibits, courteous, so that persons interested found little difficulty in getting information.

In the Illinois building there exists a remarkable collection of pipes and images from one locality, namely, the American Bottoms and immediate vicinity. This region may be defined by a circle one hundred and twenty miles in diameter, having St. Louis as its center. The exhibit is in charge of Mr. McAdams, the curator of the State Museum at Springfield. There are originals of more than thirty sculptures and casts of a half dozen. Nearly all represent large pipes cut from fluor spar, sandstone, limestone, slate and catlinite. Of the latter material several are modern, the rest pre-Columbian. In this connection, it might be well to add that not all Catlinite pipes are modern. Two unfinished specimens representing the ancient platform pattern, so often found in the mounds, were taken from a cache in Southern Ohio not long ago. The specimens have every indication of great age. Pipes, such as Mr. McAdams owns, are found throughout the territory of mound building tribes. Two forms are noticed,—the kneeling or sitting figures, ranging from 4x5 to 7x6 inches, and the small effigies. The latter seldom occur among the Northern tribes save in Ohio and the American Bottoms. The life represented may be fish, birds or animals,—seldom are they patterned after man. The small effigies vary from four to six inches in length and range from two to four inches in height. In the upper Ohio Valley the kneeling or sitting figures are occasionally found, but the small platform (curved base) effigy pipes, are most numerous. Again, in the mounds of the American Bottoms are both small and large types. Thus it will be seen that the forms are local (as we will later prove) and that the method of representing the subject and the degree of skill evinced in the sculpture varies.

The first special specimen, and, by the way, when we consider the primitive culture of those who made it, the finest one in the whole anthropologic exhibit at Chicago, is a fluor-spar idol. It is seated, the legs and lower portion of the body are not shown,—only the bust and waist. It weighs about fifty pounds. The stone is clear, almost as much so as quartz—the features are very like those of all the human effigies from the Mississippi Valley mounds. About the neck is suspended an ornament and there seem to be spool-shaped copper ear ornaments. While these and the cord to which the relic is attached are rather faintly cut, the face of the figure is excellent. It has that "broad stolid" look of the Squier and Davis effigies. It is unquestionably pre-Columbian.

Near the remarkable idol are a number of pipes weighing from two to eight pounds and varying from 5 inches long and 4 inches high to 7 by 6 inches. These are of the "kneeling" figure class. The toad and frog, the bear, bird and man are most frequent. In all of them the bowl is in the back, just behind the shoulders, and the stem hole enters from the rear. The most peculiar and valuable of the pipes is a large frog. It is Catlinite, yet not modern. The legs, mouth, eyes, folds of the skin and every character of the creature are faithfully portrayed. It is as fine a specimen as that one deposited in the Smithsonian (of sandstone) formerly owned by Leonidas Simonton and exhibited at several foreign and American expositions. Mr. McAdams' frog is really a work of art. Next to the idol it holds first place in the exhibit. His human figures show the features and shoulders well, but there is no attempt at delineating other portions of the body. From none of the sculptures can one judge of the character of the garments worn by the prehistoric man of the American Bottoms. It is unfortunate that the ancient artisan could give us no information upon this important matter.

In the Government exhibit are some good originals and casts of famous effigies. As there have appeared from time to time in the Smithsonian reports and various publications, their character is doubtless familiar to the readers of the Archæologist.

In the Anthropological building the effigies to be considered occur in the collection of the Missouri Historical Society, Department M, Mr. C. W. Riggs and Mr. W. J. Seever. While there are many fine sculptures aside from those possessed by these gentlemen and the Department, yet they do not properly belong to the Mississippi Valley peoples. Mr. Riggs' collection is seen shortly after one enters the building, and therefore should be described first. While effigies in stone are occasionally found in Arkansas the gentleman mentioned has never had the good fortune to dig up any, and therefore his exhibit is confined to pottery effigies. These can hardly be classed as sculptures, therefore the description of them must be necessarily brief. Nearly all his effigy pottery represents human figures. Those few which portray fish, reptiles or animals are not as good as the sculptures in stone. This is very singular. The aborigines, who were able to make an excellent human figure in pottery failed to properly portray those of animal life. Of the human figures, the Arkansas exhibit contains several full size faces. Some of these show tattooings, while others are plain. The features are clear, cut deep, and the faces do not seem so broad and stolid as those of the pipes, from Illinois and Ohio. There is a marked difference in the facial characteristics of the full size representations and those which, although standing but eight or nine inches in height, attempt to show the entire human body. In the latter, the arms are unproportionately thin, the lower part of the body large and un-natural while the legs are scarcely represented. The heads are very small and the features mean little or nothing. The method of dressing the hair is shown and in this respect much is learned concerning aboriginal customs. Taken as a whole the Arkansas exhibit should be carefully studied by whatever museum or individuals to which it is finally consigned. It presents some features of aboriginal life which are not apparent in the finds from other localities.

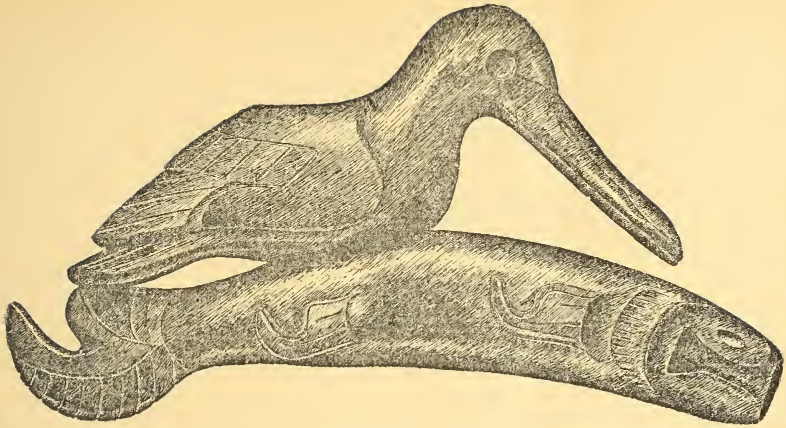
In the Missouri Historical and Mr. Seever's collection, there are several large pipes mostly of the "kneeling" pattern. Notably among these is a frog and a human figure. They are just like those of Mr. McAdams' and naturally belong to the same people. The features of the men are very good, and nearly every part of the frog is clearly outlined. In this collection there are a number of smaller pipes, platform and otherwise. They are all beautiful illustrations and show much skill on the part of the maker. While passing over Mr. Seever's collection, it might not be out of place to add that he presents the largest and most beautiful series of flint, stone, and hematite implements of all the exhibitors at the Fair.

The official exhibit by the Department contains a number of beautiful sculptures in bone, slate, stone and terra cotta. The most remarkable of these, the Chief of the Department has kept in his office and not permitted it to be upon exhibition.

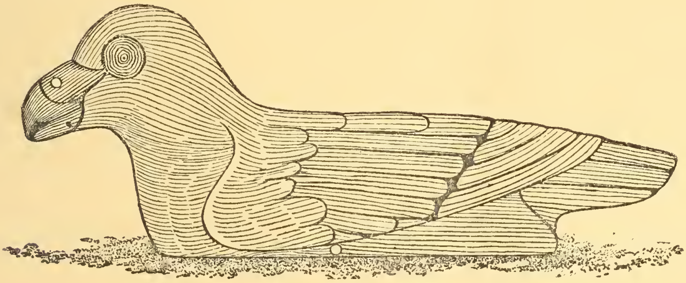
The large illustration accompanying this article represents the effigy to which we have just referred. It is made of terra cotta one authority contends, while another pronounces the material to be graphite slate. We are of the opinion that the latter is correct. As the illustration shows, the pipe presents a woodcock sitting upon the back of a grotesque fish. We know of no fish similar to this. The fins have been purposely made unnatural by the primitive artisan. The head is flat and extended like that of a cat fish. Why the bird should be so true to life and the fish so grotesque, we cannot say. Some of the feathers, and a few scales of the fish are shown. The bowl is in the back of the bird and the stem is the mouth of the fish. Neither of these show in the illustration, as it would spoil the best view of the pipe to exhibit it in any other position. The four smaller pictures represent two birds and one beaver. The large bird and the beaver are carved out of bone, while the longest one is of stone. These four figures are very like the type Squier and Davis so often found. They are seldom seen in the private collections of prehistoric specimens, as the museums are invariably on the lookout for such valuables.

It can truly be affirmed that the fish-woodcock pipe represents the highest type of sculpture the Mound Builders of the Mississippi Valley have produced. Well might the Chief of the Department guard it jealously, and keep it safely housed in his private desk. Such a pipe could hardly have been smoked, —it is too precious, its mechanism too delicate to warrant the risk that heat in the bowl would involve. If smoked at all, the fumes from the dainty mouth of the fish were to be drawn only at important councils, during impressive ceremonies or by a veritable chief of chiefs. There is nothing European suggested in its graceful, yet grotesque, lines.

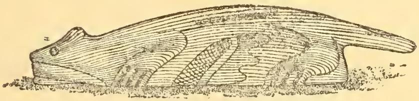
It must not be imagined that the effigies of the regions mentioned are confined to pipes and idols. Squier and Davis found a number of human heads cut in bone. In the same alter, in which was found the double effigy referred to at such length, were three large pieces of bone, apparently parts of deer antlers. Two of these were broken, while the third was almost whole. They represented three human faces, and as far as can be judged all of them show



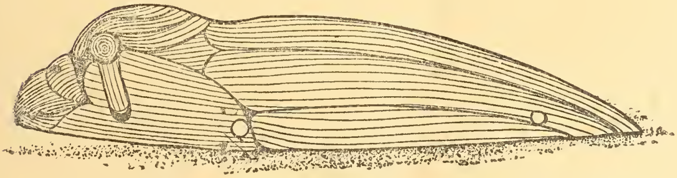
Fish-Woodcock Pipe from the Hopewell Effigy Mound Altar; found by W. K. Moorehead, '92.



Effigy of Bird in Bone; Effigy Mound, Hopewell's Farm, Ross county, Ohio.



Effigy of Beaver in bone; from the same mound as the others.



Effigy of Woodpecker in Steatite; from the Hopewell Effigy Mound.

a "broad stolid" feature so common in all effigies made by the Mound Builders to portray themselves. Judging from the one nearly perfect they were originally about four inches in length, and the face occupied about an inch and a half of the bone.

In the fore part of this paper, we suggested that development in sculpture was local. That is indeed true, and every year's field work tends to add more facts to this singular feature of American Archæology. In the American Bottoms, about Nashville, at Etowah, in the Scioto Valley and in sections of Arkansas are large village sites. Near them are the burial grounds or tumuli. The best implements, the most copper, sea shells, obsidian and other foreign substances exist in these large communities. In the small scattered villages and mounds there is little evidence of great trade with surrounding tribes, there are few indications of any skill in representing life. The large villages would be free from the attacks of roving bands. There, secure from harm, free from hunger (because of great stores of corn and dried meat) the primitive artisan could, year after year experiment and improve upon his work in copper, flint, clay, and stone. He soon learned to make better models of the animals, birds and fish which he saw about him. His early attempts must have been necessarily crude. Perhaps the rude effigies which are often found present the first efforts at sculpture. Again, in the smaller villages the sculptures are not equal in artistic conception to those in the great regions which have been named. It is very probable that the inhabitants of the small and remote towns copied the work of the more skillful sculpturers.

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ANTIQUITIES OF BOONE COUNTY, MISSOURI.

Boone County is an excellent field for the antiquarian, but strange to say nothing has been accomplished except the opening of a few mounds. It is true that a great many good specimens of aboriginal art have been found, but these discoveries were in most cases accidental, and not due to search. I know of nothing that has been written concerning prehistoric remains in this county.

Having opened twelve mounds and having explored the country in the greater parts of Columbia and Missouri townships, I shall in a brief way give the results of my work.

Every mound that has come under my observation is situated on a high ridge not more than a quarter of a mile from some permanent water supply. These mounds occur both solitary and in groups; but the groups are small, generally containing only two mounds

In nearly all cases the mounds are composed of flat stones, packed yellow clay, and surface soil, and vary in altitude from six inches to eight feet or more. The diameter varies from twenty feet to one hundred feet. In no case have I found immediately around these mounds a noticeable depression. It is therefore concluded that the soil found in them must have been scooped up from a large area on all sides.

Inside the mounds are walled enclosures, being a regular or an irregular quadrangle, or circular in shape. The greatest side or diameter of these enclosures seldom exceeds ten feet. The walls are composed of large flat stones laid in a very compact manner. Figure 1 represents a cross section of a wall.

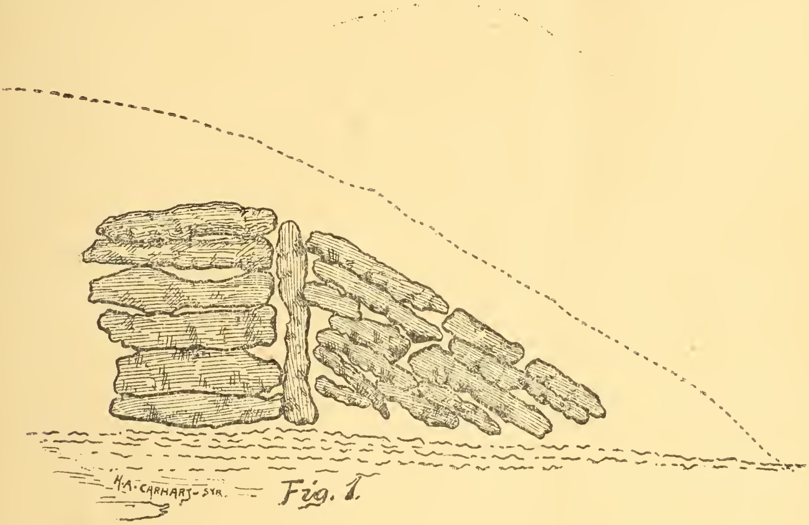

Fig. 1.

The flat stones must have been obtained with a great deal of difficulty, since they are found only in creek beds and much weathered ledges of limestone.

In some cases there seems to have been some regard for the cardinal points, but these were probably accidental.

The bodies in most mounds were lying prostrate and in regular order; but in others the utmost confusion prevailed—not even an arm could be traced out, and in one case there were three skulls in a pile. In one mound there could not have been less than thirty bodies buried, and the mounds must have been tribal burying grounds rather than graves of chieftains, for bones of small children occur as frequently as those of adults.

Cremation was universally practiced and took place inside the walled enclosure, for the bones, inside stones of the wall, and the clay, bear strong evidence of intense heat. Oak, sugar tree, and walnut, the prevailing growth in this locality, was used in the burning.

The exhumed bones indicate a people of about the same stature as the average man of today. Fig. 2 is a skull which I believe to be a good representative of those found in the mounds.

The articles buried with the dead are nearly exactly the same in every mound. Red hematite always occurs. I have several pieces, among which is an excellent specimen bearing unmistakable signs of having been used for marking. Although fragments of pottery occur in every mound, I have found only one complete vessel. Two kinds of pottery were found, the black and the red. Both were made of clay and pulverized chert or shells. The black is the hardest and the most durable. In one mound three excellent pipes were obtained, two of clay and one of soft magnesian limestone. One of the clay pipes was perfect, and ornamented with a tree-like or feather-

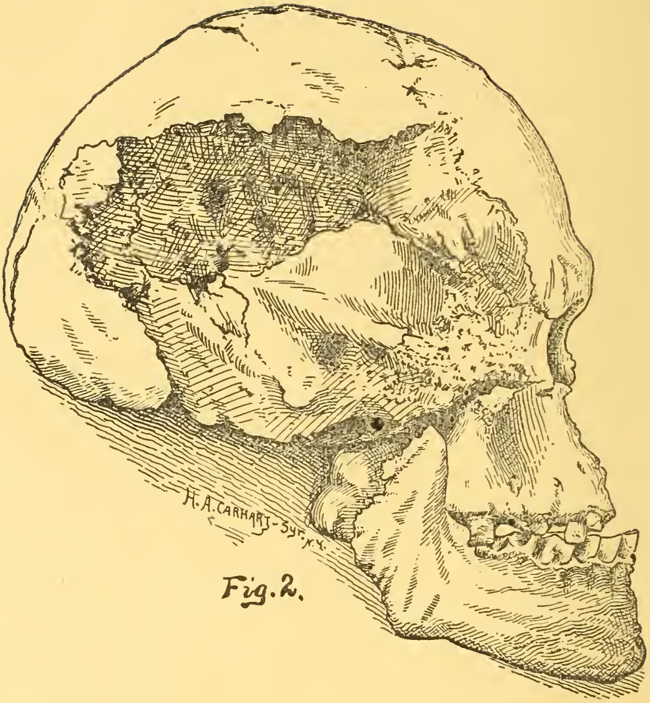

Fig. 2.

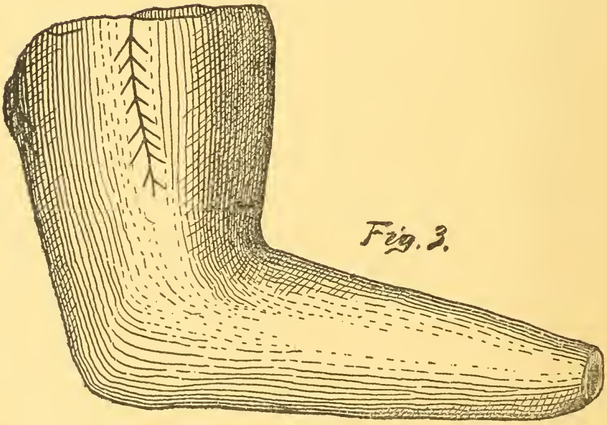

Fig. 3.

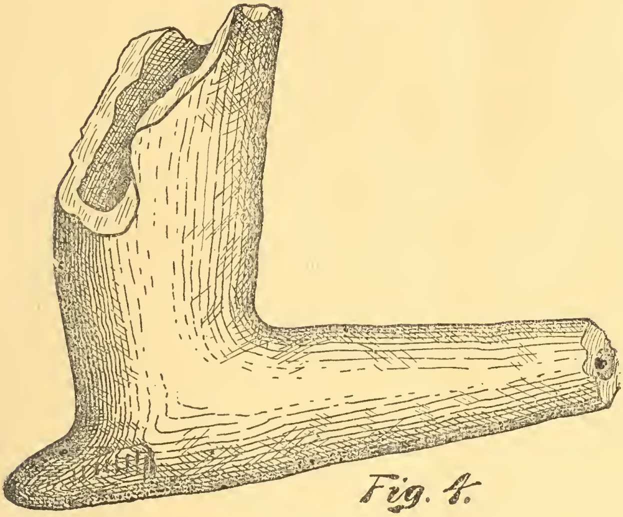

Fig. 4.

like figure. The stone pipe was weakened very much by burning and is not ornamented.

I have also found several flint implements in mounds, generally arrow-points; but these were probably in the bodies when buried, as they would otherwise have been destroyed by the heat. The implements in my possession are nearly all surface finds; some of these show very skillful workmanship, while others are very rude and scarcely recognizable. I have an arrowhead one half inch long with every size between that and a spear-point eight inches in length. The triangular arrow-head is the most abundant. The knives are of two general kinds, pointed and blunt. The leaf shaped implement also occurs here. Several hatchets, scrapers and reamers, and a few ungrooved celts have been found.

Excepting one pendant, I have found no unquestionable ornaments.

White and gray flint was almost exclusively, red sometimes, and black rarely, used in the manufacture of implements. Greenstone, quartzite, or diabase celts are occasionally met with.

No bone, copper, nor iron implement has been found in this locality.

So far as I know neither mortar nor pestle has been discovered, nor has anything been found to indicate that the primitive man of this region ground his grain or indeed raised grain.

Several species of Unio (mussel) were without doubt used as food, for their shells are found in large quantities scattered over fields and are generally found in the mounds. Implements such as scrapers are very abundant, while such as hoes are either rare or do not occur. Every tooth in my collection shows that the food contained a great deal of grit. In some cases the teeth were worn down almost to the gums. Such is the case with the teeth in the skull illustrated in Fig. 2. It would therefore seem that the food of the aborigines consisted of mollusks, fish, roots, and the flesh of wild animals. No evidence of domesticated animals has been discovered.

The shell of the common snail (HELIX ALBOLABRIS) is found frequently in the mounds, sometimes as many as twenty-five have been found in a single mound. H. ALTERNATA and H. CLAUSA sometimes occur. The shells are always large, but whether the snail was an article of food I am unable to say.

There are several interesting structures yet to be examined, and as soon as this is accomplished I will give a description somewhat in detail.

I must make especial mention of the instructions and encouragement given me by Prof. G. C. Broadhead; and for valuable assistance I am very much indebted to Dr. J. W. Connaway and Prof. C. P. Fox.

COLUMBIA, MO., Oct. 7, 1893. WALTER H. FICKLIN.

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RELICS ON THE KASKASKIA RIVER.

This river is here called the "Odaw". Why the natives prefer this name to that given by geographers the writer has not been able to ascertain. From the mouth of this stream to its source it is noted for flowing through wide and marshy lowlands. This can also be said of its tributaries. While this feature is more or less common to all our rivers, yet are the bottoms through which flows the Kaskaskia of a much greater width, and subject to many overflows which prevent general cultivation of the land. The hills beyond the lowlands, as well as a goodly portion of the marshes , were once covered with considerable large timber, such as oak, walnut, hickory, and sycamore, which has nearly all been consumed by white settlers, who upon their first appearance here preferred to remain on the hilly wooded belts to that of the prairie. Here also the aborigine once made his home which is made manifest by the many fine stone objects found. The prairie is now also all under cultivation, but with the exception of a few small scattering arrow-points nothing else is found by the farmer. Where, however, the prairie fields border on small streams or marshes fine relics are obtained. The mounds found along the river are also situated on the hills, are of medium size and in form, excepting one, are of the round conical type. The exception is a long shell covered mound two miles due east from Carlyle, one mile from the river, 250 feet long, 14 feet wide, with an average height of one foot. A portion of this mound is included in an orchard, and the remainder in a garden. Cultivation, no doubt reduced its height. Earth, it appears, was first used in its construction, after which it was covered to a considerable depth with shells of the mussel. This is inferred because no shells have been found in the stratum of ground lying on the original surface. It may have been a burial mound. Its present owner told the writer that ten years ago a negro in digging holes for posts for the garden fence, unearthed a pipe and human bones, which were replaced by the digger because of superstitious ideas.

The relics obtained in this vicinity are mainly chipped flint implements and polished, grooved stone axes. The polished ungrooved axe, flesher or celt is somewhat rare. Neatly flaked flint celts, and in a few instances a few of the same material beautifully polished have been found. The grooved stone hammer and bell-shaped stone pestle peculiar to Ohio and eastern Indiana are exceedingly rare. Nor is found the roller or long cylindrical pestle. A form of stone axe often found here has a groove completely encircling it. Its blade is rather thin and broad, and it may have been used as an agricultural implement: for its shape resembles much the chipped flint hoe which differs only in being notched on opposite margins instead of grooved. The average weight of medium sized grooved stone axes and notched flint hoes is about 20 ounces. Grooved axes of monstrous size and weight are found here. Three of the largest secured average twelve pounds each. These were obtained at an equal distance of ten miles apart. One of them grooved on all sides is made from hematite or specular iron ore, sometimes called blood-stone. This mineral contains about 95 per cent. of pure iron, which, when polished, produces a brilliant metallic luster. From Missouri are obtained the greatest number of hematite objects, which material is found in the large iron mountain in that state. The other two specimens are grooved on three sides. The writer is much interested in these large implements. Why were they made, and who were the giants that used them? Or were they never used as were the smaller grooved axes? The smallest grooved axe obtained weighs less than two ounces. It was found near one of the twelve pound implements.

Large flint agricultural implements are the magnets which draw to this section the collector. The writer obtained a few a foot and more in length.

Visitors to the World's Fair would see in the exhibit of the Missouri Historical Society the largest collection of flint hoes and spades extant. There are seventy-five of them. Nearly all were found in St. Clair county, Illinois. The Kaskaskia river flows through the eastern part of this county which we expect to reach as we move down the river. We set out from Ohio on the fifth of last June with wagon, collecting on the way to this locality, obtaining, however, nothing that would interest an old or experienced collector. Hence disappointment was our share very often. The writer was much interested in the great variety of material and local oddity of types as he slowly wended his way westward. He was also favored with excellent facilities to observe peculiarities in other localities: and also to meet on the way types and material originating in Ohio which gradually grew less as the distance from that state was increased. It is hard to tell where is situated the line that divides Ohio objects from those that were brought from the west and south-west. This, the writer supposes, can be determined by a number of overland trips eastward or westward through Indiana.

Beginning at the head waters of the North-Fork of White river toward Vincennes, and on the Wabash river west of Indianapolis was seen none of the material obtained at "Flint Ridge" in Ohio. Slate relics grew less, and the last one was obtained at Brooklyn, Morgan county, Indiana.

In Owen county, six miles north of Spencer, crops out of the ground a peculiar mottled jasper. Only a few implements made from this material were seen; yet along the bluffs near the river lie countless numbers of chips and flakes of this jasper. There is evidently an ancient quarry in either Owen or

Morgan counties from which was obtained the jasper which was carried to the river's banks to be worked into desirable implements. Flint objects found on the North-Fork of White river west of Indianapolis on to Clay county, Illinois, are nearly all of them of a dull drab or slate color, similar in appearance to the flaked flint relics found in Kentucky and western Tennessee. These were made from the material cropping out on the surface on the Cumberland river in Montgomery county, Tennessee. In most cases the "caches" of flint blades discovered in Indiana and Ohio were made from this Tennessee stone. A few years ago was however found in a mound in Van Wert county, Ohio, a deposit of flint blades which were made from "Flint Ridge" material.

On the Wabash river is found a sprinkling of implements made from the white and pink jasper found in S. W. Illinois. This desirable material was first noticed in small quantities on the tributaries of Big Muddy river in Clay county. Accompanying it were but few specimens made from Tennessee flint. It was not until the writer reached the Kaskaskia river, a tributary of the great Mississippi that the beautiful pink and white jasper predominated. The large flint hoes and spades found in S. W. Illinois are nearly all made of the drab Tennessee material. Now and then are picked up the same objects made from pink and white jasper. A few deposits of blades made from this material were also found.

It may perhaps be safe to say that the country lying between the Kaskaskia and Wabash rivers is the dividing line separating Ohio relics from those derived from other sections. It is also interesting to note that where flint implements are made from Ohio and Indiana material are lost sight of, discoidal stones and agricultural implements appear. The first flint spade and bi-concave discoidal stone were secured in Lawrence county, Illinois. It is to be hoped that the quarries from which was obtained the material so often mentioned in this paper, and from which the aborigine made his implements which he spread over so large a portion of country may soon be discovered by an archæologist, who will describe them for the benefit of those interested in archæological science. J. R. NISSLEY.

CARLYLE, ILL., Aug. 2, 1893.

THROWING STICKS.

I have just made a discovery that has given me great pleasure. In the Anthropological Building at the World's Columbian Exposition is a Cliff Dweller's Exhibit, exposed by the state of Colorado. Other loan exhibits are in the building from that region, and outside is an attractive realistic representation of the industrial products of the same people. In looking carefully through the Colorado State alcove I discovered two examples of the Mexican atlatl or throwing stick. The shaft is a segment of a sapling of hazel wood. At the distal end is a shallow gutter and a hook to receive the end of a spear shaft. At the proximal end or grip, in the more perfect specimen, about four inches from the extremity is a loop on either side of the stick, one for the thumb, the other for the fore-finger. The remaining three fingers would be free to manipulate the spear shaft. These loops were made by splitting a bit of raw hide, sliding it down the proper distance on the stick, forming loops less than an inch in diameter by bringing the projecting ends of the rawhide and seizing it fast to the shaft. Just below these finger loops or stirrups were a long chalcedony knife or arrow blade, the tooth of a lion and a concretion of hematite seized by a plentiful wrapping of yucca cord. If the readers of SCIENCE will recall the Bourke example from Lake Patzcuaro, with its long, barbed spear with shaft of cane, he may follow me further and believe that a bit of cane and a spear head of chalcedony attached to a tang or foreshaft of wood lying in the same case, and pointed out to me by Mr. C. C. Willoughly, belonged to the same outfit. This is the first instance of finding the ancient atlatl, figured in the codices and described by Mrs. Nuttall. It also connects the Cliff Dwellers with the Mexican peoples.—O. T. MASON IN SCIENCE.

ANTIQUITIES IN DEER CREEK VALLEY, KANSAS.

Many traces of a prehistoric race have been discovered in Deer Creek Valley, in Shawnee county, Kansas. Isaac Stull. while digging a cellar, unexpectedly exhumed a human skeleton together with fragments of pottery, a few teeth, some worked flints, a portion of a stone axe, and other objects of minor importance. On the same place, while a well was being dug, a large quantity of charcoal, burnt clay, fragments of pottery and worked flints were found six feet below the surface. Similar remains have been found on different occasions along this valley, and it is believed that an extensive population once existed in this section of Kansas. Some of the bones unearthed are badly decomposed. The remains which were unearthed on Mr. Stull's place were found in the edge of an open spot which old settlers have termed "Indian fields". Many arrow-points, flint knives, and axes of superior finish have been picked up in these "fields".

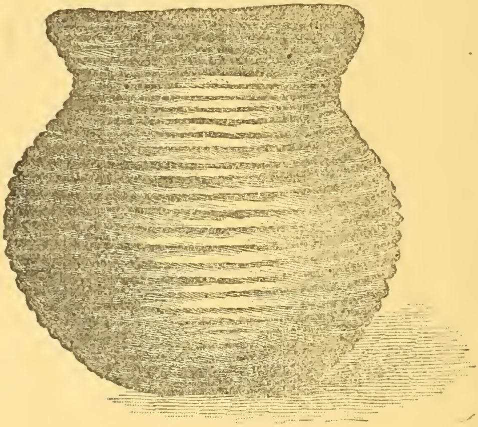
Mr. J. A. Montgomery, of that vicinity, gives it as his opinion that this valley affords a rich field for explorations, and he says that he will embrace every opportunity to develop it. GEO. J. REMSBURG.

ATCHISON, KAN.

PREHISTORIC COIL POTTERY.

(*Science, Vol. xxi, No. 531. Pp. 191-193.*)

In the dim past when primeval men occupied this continent, no one knows for how long a period, they raised mounds, dwelt in caves, or built towns that are now below the surface of the earth. In all this long era they used flint or stone implements for all edged tools, hammers, axes, spears, etc. At the same time having no metal pots or kettles, a rough earthen ware was used for cooking and for all other uses for which we now use iron, tin, and wooden vessels. There is somewhat of a resemblance in many of the stone implements all over the world. It is only recently that it has been discovered that there is a similar resemblance in much of the pottery of this early age, especially in the coil pottery. This pottery was made by rolling clay into long strings like cord, and while soft beginning with one end to coil it round and round, increasing the size of the bottom till it assumed the desired dimensions, then shaping it up the sides (just as straw hats are made) till the required form and size was attained (see illustration.) The most extraordinary part of the investigation is that this ware made in the same manner is found in the mounds of Ohio and Florida, in the cliff-dwellings of New Mexico and Arizona, in the buried cities of the canons of these territories, also in the Connecticut Valley and under the ancient shell-heaps of Cape Cod, Mass. What a long period of time it must have taken to have this art disseminated over so vast a territory at this early age. According to the uses these pots were intended for, so were they made large or small, thick or thin, and of various shapes. It was a common practice to use some sharp instrument to dint or work up some fanciful designs without obliterating the lines of the coil; in some cases they are beautifully marked, looking like carved black oak, others made of light-colored clay in very fine coils prettily indented forming neat designs. Some of the best ware is handsomely smoothed and rubbed to almost a polished surface before baking. All are smoothed inside, before they were dry; probably some of those intended to withstand heat have plumbago mixed in the inner surface of the vessels. There are many fanciful designs of this ware, some very large jars, pots of all shapes, bowls, cups, pitchers, etc. HENRY HALES.



COIL POTTERY.

RIDGEWOOD, N. J

The ARCHAEOLOGIST

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EDITORIAL.

With this issue The Archæologist appears before you not only enlarged eight pages of excellent reading matter; but clothed in a new and handsomely engraved cover which adds to the magazine an attractive appearance.

Attractiveness, however, is not the main object in the publication of this journal.

The publishers have exerted themselves still more in having obtained for their readers articles pertaining to archæology which emanate from the minds of writers who stand foremost in the ranks of the science which this publication seeks to elevate.

These authors are Brinton, Abbott, Maron, Wilson, Mercer, Moorehead, Hough, Fowke, Snyder, Wickersham, Dorsey, Deans, Smith and others. That the journal will for the coming year attain a standard of high grade the names printed above are evidently sufficient.

The publishers, however, wish it to be understood that while they aim to attract the attention of the expert and specialist, the student and collector, are not to be forgotten. The majority of articles to be published are such as will interest and educate the beginner and make of him a true scientist. For him more than for the expert has the publication of the Archæologist been undertaken, and with the knowledge too that it would be up hill work and devoid of monetary profit.

No collector of relics pertaining to pre-historic art, nor student can afford to be without it.

The publishers believe that they do not err when they tell their readers that up to the present, Vol. I., which is nearing completion has given satisfaction. This is proven by the fact that subscriptions have been coming in continually. Of the price of subscription nothing need be said. No journal pertaining to the science for which it stands was ever offered cheaper.

Therefore, reader, if you like this journal, and the publishers believe you do or you would not have become a subscriber, will you not speak a good word for it to your friends and acquaintances, who too might become interested in archæology, and who, perhaps, are not aware that a journal devoted to this science is being so cheaply published? The readers of a magazine are its best friends, and to these must it be said that it will take but little effort to mention the Archæologist wherever they happen to go.

Vol II. will begin with prospects of great brightness, and our readers can rest assured that everything will be done to command satisfaction.

THE EDITOR.

The Scope of this Magazine.

[*By the President.*]

With this issue the Archæologist begins to enlarge its size and better its condition. As each successive number is produced. pages, illustrations and special articles will be added. It is the aim of the new management to build up the journal until it shall occupy a foremost position among archæologic publications. To do this necessitates the co-operation of all scientists, collectors, students and persons interested. No journal of this description ever started under more favorable auspices. It has a solid financial backing, its officers are young and energetic: It only devolves upon all those into whose hands this special edition of many thousand copies shall fall, to speak a word to friends, to show this copy to collectors and to subscribe for the Archæologist. Certainly the price for twelve numbers is low.

The management is aware that there are but a few thousand persons interested in pre-historic anthropology in this country. It therefore desires to bring together through a common medium, all these people, to make them acquainted with each other and with the authorities in the several branches of our New Science. We call attention to our correspondence department,—all collectors are invited to participate in occupying its columns. We want you to describe interesting objects of your collection, to tell about the ancient earthworks, villages and mounds of your neighborhood. If all co-operate, it will take but a few months to place the Archæologist upon the high plane where its officers long to see it.

Therefore, we ask you in all sincerity to help us in this worthy project. We want you to send us the names of all the collectors of your acquaintance—all persons rendering us this favor will have refunded the postage expended in writing us.

In several directions the Archæologist will extend its influence. It shall open its pages to debate upon all questions concerning the life of our aborigines. It shall insist upon the preservation of mounds, earthworks and caches. It shall not discourage collecting, but its influence shall be brought to bear upon those who destroy valuable prehistoric monuments merely for the sake of obtaining relics for sale. It shall endeavor to dissuade ignorant persons and beginning collectors from examining mounds, graves and village sites.

The Archæologist will constantly keep on hand the literature of the subject and all interested can gain information upon any subject for but a trifle above the cost of printing,

In conclusion the management once more asks you to carefully inspect the November issue, and will thank you for your aid in making this journal a credit to the science, and an aid to every one engrossed in the study of this interesting, singular people,—"The American Race."

CORRESPONDENCE.

Ed. Archæologist:

It may be of interest to your readers to learn that about the mouth of the Animus River, New Mexico, and further up the river near Aztec are the remains of ancient pueblos. The old pueblo near Aztec was originally three stories high and covered about thirteen acres. In several places it is very well preserved and many of the rooms are still intact. We examined some of these rooms. The beams in the ceilings are of Spanish cedar over which a lacing of pinon has been placed. In the adobe bricks inside the rooms the imprints of the builder's fingers are still to be seen. There are several large estufas among the ruins. They were thought for a long time to be sweat rooms, but later investigators say they are simply living rooms.

On the site of these ruins we picked up many stone axes and celts, most of them being very rude. The plains around this pueblo are literally covered with fragments of pottery, many of the designs being very unique and beautiful. The winds which seem to blow eternally in that country catch up the light sand and deposit it on the ruins. In going over the ground again and again we found many arrow and spear heads. After a shower by going down on your hands and knees you can find the very small arrow points. They have been made of flint, jasper, moss agate, etc., and are extremely beautiful, resembling the famous Oregon points. We found a number of stone pestles and grinders.

Ruins of such character as we have described are scattered through the San Juan country near the water courses, often the fierce winds of the desert sweep the sands about a ruin until it is hidden from sight. The mounds thus formed are occasionally opened by the people of the neighborhood. The newspapers invariably write up discoveries of pueblo or boulder ruins as "Wonderful Aztec City found" or "A Lost Race." They even go so far as to find statuary, Egyptian mummies," and so on. As any archæologist knows, this is all trash.

It is encouraging that your magazine will discourage sensational reports, and publish truth concerning ancient monuments of the southwest.

WM. W. RALSTON.

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ATCHISON, KAN., Sept. 22, '93.

ED. ARCHÆOLOGIST:

My friend, Mr. Roy F. Greene, of Arkansas City, Kan., who is much interested in archæology writes to me that he has just located 22 mounds about ten miles south of that city in the Cherokee strip, which I think is the first mention of any mounds or other aboriginal remains in that country. Mr. Greene's time was somewhat limited and therefore he opened only two of them. In these were found fragments of pottery, charred human bones, one pipe, one celt, a great many flint arrow points, several spear heads, etc.

Mr. Greene will probably continue his researches in that country at an early date, and if he does, we will let you know the result.

I am much pleased with the ARCHÆOLOGIST and wish it unbounded success. GEO. J. REMSBURG.

NOTES AND NEWS.

Many readers of the ARCHÆOLOGIST have doubtless noted in the papers the establishment of the great Columbian Museum at Chicago. This Museum will well perpetuate the name of the Fair and its promoters deserve a great deal of credit, they having given this new science such a substantial recommendation. It is proposed to gather all the materials which can be added by purchases or donation now on exhibition at the Fair into the Art Gallery. There they will remain for a year or so until a permanent museum can be constructed. This museum will have five great departments. Geology, Zoology, Botany, Mineralogy, and Anthropology. Each department will have some person high in authority as its chief. The management of this journal wishes the enterprise, and those of our friends and acquaintances who are to be connected with it great success.

Those who have taken objects to Department "M" at the Fair have been bitterly disappointed with reference to purchasers. While the management of this paper discourages the promiscuous dealing in specimens from the mounds, graves, village sites and ruins, it recognizes that many men of moderate means who have given their lives to the study of the American Savages, can only hope to get back in part the money which they have expended through the sale of their collections. A good many people, as Mr. Berlin well said in his October Editorial, will make sport of this and say that no scientific man should buy or sell Archæologic objects. This is all bosh. The Smithsonian, Peabody Museum, Department "M" and many worthy city museums have bought collections at their expense and scientists must sell at some time or other or fail financially. We are not in favor of a man living from hand to mouth as many wretched professional men do, because of false pride and wrong notions concerning the financial value of Archæologic material. One MUST recognize that it takes money to do any kind of work and that while a man in this science is giving his labor largely for the love of the cause, yet if he has not the "wherewithal" that hard-hearted and close-fisted business men recognize, he cannot hope to accomplish any results. Apropos of what has been said it is quite discouraging that several grand collections from various parts of the world have found no purchasers. Any one could split up a collection and sell it out to Tom, Dick and Harry. But when this is done the cabinet loses its interest and importance. Possibly the Columbian Museum will afford an opportunity for those who have spent considerable money to reimburse themselves. But we have it direct from those in authority in the museum that no one who has a collection not properly labeled, a promiscuous collection or a collection made in ignorance, can hope for a sale. Such high and dignified institutions as the Columbian Museum, the Peabody and the Smithsonian have set their faces strong against the destruction of monuments, the digging of relics by incompetent collectors simply for the sake of personal gain.

At no time in the history of this country have more persons been interested in Archæology than at the present. Nearly every one from Maine to California, included in the above sentence has seen the exhibit at the World's Fair. Of course many have gone away with new ideas, many have become educated to the real importance of the science as taught by modern institutions,—and there are those who seem to fail to understand or appreciate what has been done. It is with a great deal of regret that we note the passing of the Exposition. One of the officers of this company stood by a large display, day after day, for nearly the entire period of the Fair. That person had seen a number of Expositions but there was not in all of them together the interest and enthusiasm exhibited as was on the part of the visitors to Department "M." Undoubtedly as a whole the Department will be productive of great good. It certainly succeeded in bringing thousands of people of kindred minds together. The ARCHÆOLOGIST has the names of over half the persons interested who visited the building and as it shall, from time to time send copies to them it begs in turn that they will speak to their friends andacquaintances concerning the scope of the magazine. There is no journal now, in America, which has attempted to bring together all persons engrossed in this study. Hence we should all endeavor to aid the management in making the ARCHÆOLOGIST the foremost publication of this sort in the United States.

Moki Indian Sand-Painting.

Two specimens of the Moki Indians' sand-painting, copied accurately from the originals, have been placed on exhibition at the National Museum in Washington. Perhaps they might better be called mosaics, being done in sand of six different colors on a flat, horizontal surface. The colors are yellow, green, white, black, and a mixture. Such pictures are made by Moki priests and priestesses on the floors of their subterranean chambers. The six colors stand for the cardinal points. Yellow is the north, green is the west, red is the south, white is the east, black is the region above, and all colors signify the region below.

One of the two sand paintings is a copy of the kind of picture made for the annual ceremonial of the Moki women's festival to the Germ God, which takes place in September. The work of art is executed during the progress of the secret rites. It represents two figures in an elaborate frame of different colors. On the left is a likeness of La-kone-ma-na, the patroness of the affair. She is clad in a white blanket. On the right is the portrait of one of the twin gods of war, who carries a zigzag of lightning in his hands.

The other picture is a fac-simile of the one made by the chief of the Fraternity of Antelopes at the festival of the snake dance. It is highly conventional in its character. Rain clouds are represented by semicircles. Parallel lines show the rain falling. Four odd-looking zigzag figures stand for the lightning snakes, which are respectively red, green, white and yellow. The green and white snakes are female, and the yellow and red snakes are male. Around this sand mosaic are performed the weird rites of the antelope priests, who sing songs embodying the mythological drama of the Snake Hero.

It is said that the finest collection of wampum belts in New York is owned by Mrs. Harriet Maxwell Converse, who is the first white woman ever made a chief by the Seneca Indians living in that state.

◆

T. B. Fairchild recently unearthed at Ansonia, Connecticut, a number of Indian relics. In the lot is a stone hammer of peculiar form, specimens of ornamented pottery, arrow points of jasper and quartz, and the bowl of an ancient spoon.

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Mrs. Zelia Nuttall has at last solved the enigma of the Mexican calendar, which Von Humboldt and many other great scientists have worked over in vain. Years of work had trained her mind to the task of unraveling this mystery of the calendar stone. Her conclusions have been accepted as final by the archæologists and astronomers, and she will soon publish an elaborate work on the subject.

◆

The Khedive of Egypt has presented to the new American Consul General Frederick C. Penfield, five enormous cases filled with antiquities of great value which have been dispatched to the Smithsonian Institution at Washington. Among the contents of the cases are six or seven elaborately inscribed sarcophagi of wood, a choice example of Saracenic art, and a box which contained when found at Thebes, the mummy of a once interesting personage, for the papyrus record proclaims her to have been the "great lady of Ashron, the musician with the hand for Maut," and the great singer of the retinue of Ammon Ra, king of the gods. The head of this wonderful coffin bears a representation of a solar disk in the arms of the goddess of heaven. A smaller or inner coffin portrays the deceased in the presence of Osiris, prince af eternity, and shows a figure of a goddess with a double head, one a ram and the other a crocodile, and the great singer in flesh and blood drinking of the water of life poured from the resplendent vessel by a goddess. A representation of the pillars of heaven rounds out the tableau.

◆

The painting of the face is one of the most curious relics of barbarism on record, dating back to the very infancy of the race. The first men painted their faces in time of war to make their aspect more terrible, and in time of peace to render themselves more attractive to the fair sex. The sense of color in those primitive epochs was far from being as delicate as that of the modern æsthetic. If the pale shades invented by the dyer of these days had then been known, they would have been dispised as offering nothing tangible to the vision. The first colors were red, yellow, blue and black, found in a state of nature or prepared by simple methods, and the only rule of art for their use was that they should be liberally applied. The American Indians, when they crossed Behring strait from Asia or were blown across the Pacific at some date so distant that it can only be guessed at, brought the custom with them, and those which civilization has spared preserved it to the present day in its prestine purity.

All the ancient tribes of the north of Europe practiced a similar mode of decoration when discovered by the Romans—those of Germany (mentioned by Tacitus), the Britons and the rest almost without exception. The Picts, who were a Scottish tribe, must have used an abnormal quantity, as their name implies, to have justified the special appellation. The custom was from the first so general, so typic savagery that it resembles an instinct—that is, it is one of those blind impulses of unenlightened humanity which only a high state of civilization could correct in the case of men, and in the case of women an object more feminine.

◆

Monster Ear-Rings in Borneo.

In a paper read recently before the Royal Geographicel Society, London, England, on the highlands of Borneo, in the Indian Archipelago, Charles Hose gave an account of how the native mothers stuck huge ear-rings through their daughters' ears at the age of eight months only, eventually increasing them to the weight of two pounds each. By the time that a girl has come to her maturity her ears, thus weighed down, reach almost to her elbows, and Mr. Hose has seen one woman put her head through one of those elongated ear-lobes. In the south of Italy long and heavy ear-rings are worn, though not approaching those of Borneo.

◆

Mr. Ernest Volk has been working in the Deleware Valley, making a collection illustrative of the earliest existence of man on the Atlantic side of the continent. He has explored the ancient argillite work-shop discovered a few months ago, and has made a geological and archœological study of the place to ascertain if it belongs to the gravel period or to that immediately following the deposition of the gravel and before the advent of the jasper using people. This work-shop Mr. W. H. Holmes refers to in his article in the JOURNAL OF GEOLOGY to prove that all the so-called paleolithics are rejects from modern Indian work-shops. The relics from this work-shop will be on exhibition and can be compared to the argillite relics which Dr. C. C. Abbott has taken from the gravel beds at Trenton, N. J. It will probably be ascertained whether there are any finished relics—such as were used by the Mound builders and the Indians of the neolithic age—to be found among the argillite specimens. If they are all made specimens, we see no reason why they should not be called paleolithics; but if they are mingled with pottery and other relics, some of which are polished and finished after the ordinary type of modern relics, then they may properly be called rejects. The archæologists of this country and Europe will undoubtedly study these rude specimens with as much interest as they will the finished specimens from the cliff dwellings.—American Antiquarian, Vol. XV. No. 3, p. 189. May, 1893.

Kansas Antiquities.

George W. Racey, a well known collector of Baker, Brown county, opened an Indian grave near the village of Lyle, in Decatur county. It was located on an elevation of ground near a fine spring. A large cottonwood tree stood near by the shadow of which fell on the grave at noon. This tree measured over four feet in diameter. At a depth of about five feet below the surface a human skeleton, badly decayed was found. The skeleton measured about six and one-half feet in length. With it were found small bits of something resembling buffalo skin together with two buffalo horns which indicated that the deceased had been wrapped in a buffalo skin. The horns were polished and hollowed out and had evidently been used for drinking cups. Among other articles found were about fifty flint arrow points, a spear head measuring five inches, two stone pipes and various other stone implements.

H. L. Cadwalader, of Wellington, found in Wichita county a small arrow point made from a beautiful agate, also a mocasin last made from red granite, a number of beads and other relics. Mr. Cadwalader reports a cave near Wellington in which Indians are buried A body which was dried or mummified was found in one of these caves. Mr. Cadwalader found in that vicinity a stone which physicians pronounce an exact representation of a human brain.

Ed. Secrist, of Randolph, reports two mounds near that city which have never been explored. Mr. Secrist discovered these mounds about thirty years ago. They are located on high bluffs overlooking the river.

A. B. Hoover, of Paola, says that there are several Indian burying grounds around that city. In grading for the road bed on the M. K. & T., R. R. human bones together with a dozen arrow points and two copper ear rings were unearthed. The sexton at the Paola cemetery in digging graves occasionally finds bones, all kinds of stone implements and beads. In digging a place for the foundation of a mill a complete skeleton and portions of other skeletons were found. A great many relics have been found by farmers in that vicinity.

Dr. T. A. Lowe, of Kansas City, mentions two large sandstone slabs in Labette county which are covered with aboriginal engravings. The engravings consist of almost everything that the Indians ever seen. One figure is the representation of an Indian moccasin. These slabs are set in the ground parallel to each other. They measure about ten feet in length and three feet in width. Dr. Lowe appropriately calls it an "aboriginal art gallery."—Missouri Valley Farmer.

Professor Kauffman has presented to the Egyptian department of the Royal Museum at Berlin a beautiful portrait of the daughter of Herod, who died at the age of 35. He found it at Havara, together with the mummy of the young woman. It is painted on linen, full face, with a gray background. The black curly hair is parted in the middle, the eyes are brown and large, there are strings of pearls in the ears and golden hoops around the throat. It is a portrait that testifies to the art of the age. The name of ths original was Aline.

◆

A ship's officer who has spent much time on the St. John's river, Florida, thinks that he has solved the problem as to the origin of the shell mounds that occur along the stream. The river twists about in an extraordinary way, so that in many places the view along the water extends for only a few rods, but he finds that a tall object or the smoke of a fire shown from the top of one of the mounds could be seen from those next below and above.

He believes, therefore, that these eminences were Indian signal stations, by means of which the natives were able to announce the approach of a hostile force along the river, as the Greeks signaled the news of the fall of Troy to their home cities by lights on the mountain tops that were repeated from peak to peak.—Military Times.

◆

At a recent meeting of the Anthropological Institute, England, Dr. E. B. Tylor, F. R. S., exhibited a collection of the rude stone implements of the Tasmanians, showing them to belong to the palaeolithic or unground stage of the implement makers' art, below that found among prehistoric tribes of the mammoth period in Europe, and being on the whole the lowest known in the world. Fragments or rough flakes of chert or mud-stone, never edged by grinding, but only by chipping on one surface with another stone, and grasped in the hand without any handle, served the simple purposes of notching trees for climbing, cutting up game, and scraping spears and clubs. The Tasmanians seemed to have kept up this rudimentary art in their remote corner of the world until the present century, and their state of civilization thus became a guide by which to judge of that of the prehistoric Drift and Cave men, whose life in England and France depended on similar though better implements.

The Tasmanians, though perhaps in arts the rudest of savages, were at most only a stage below other savages, and did not disclose any depths of brutality. The usual moral and social rules prevailed among them, their language was efficient and even copious, they had a well marked religion in which the spirits of ancestors were looked to for help in trouble, and the echo was called the "talking shadow."—Scientific American, May, 1893, p. 293.

◆

Exchanges With Other Scientific Publications.

The management of the ARCHÆOLOGIST calls the attention of other publishers to its enlarged and better condition. It asks that all managers of Scientific journals will exchange periodicals with us.

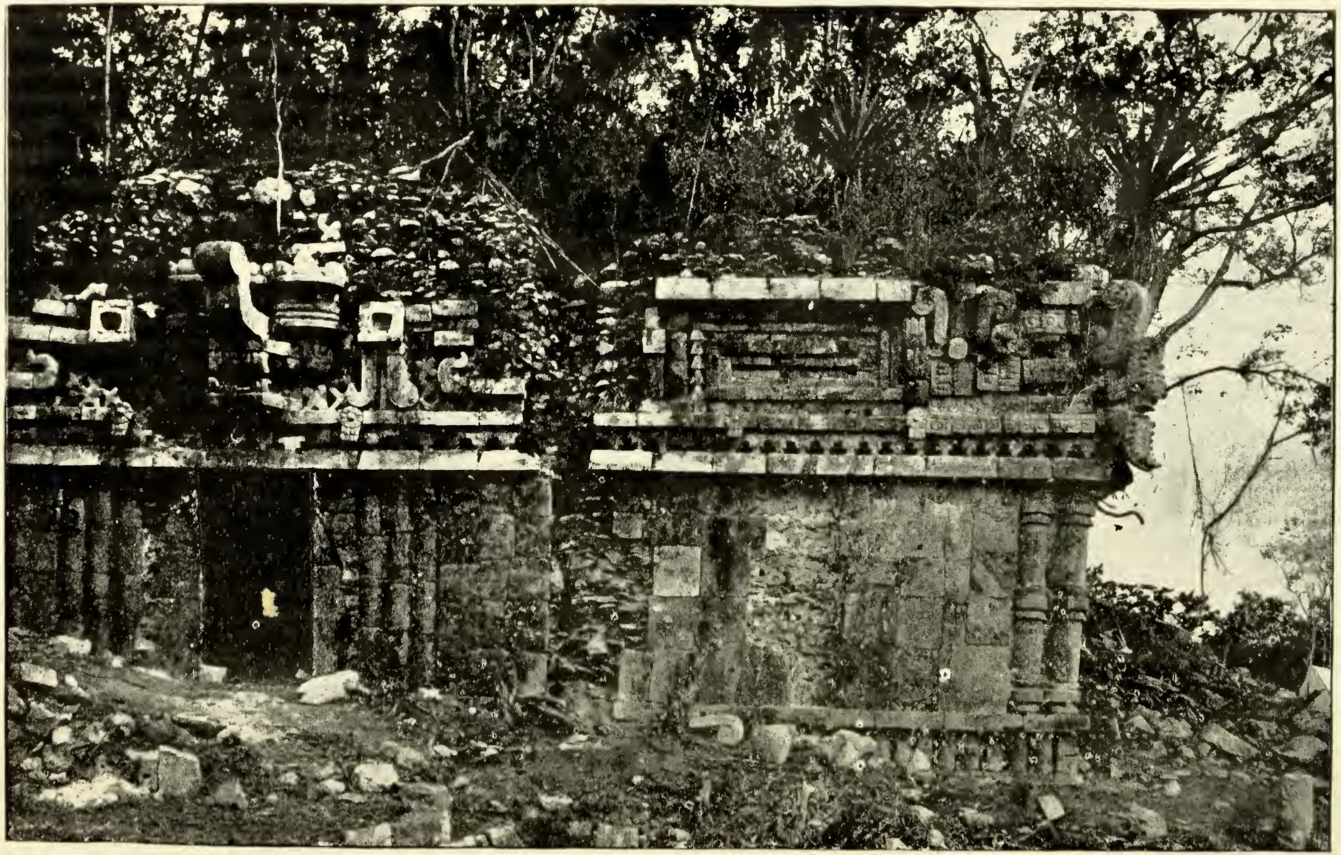
Starting anew, under favorable auspices, it can promise from month to month an increase in size and a fine series of articles upon matters of archæologic interest.

It requests that copies of publications of those to whom this issue is sent, be forwarded in exchange for all subsequent copies of the ARCHÆOLOGIST.

Owing to the large demand for back numbers, to complete files, our supply of Nos. 1, 2, 3 and 4 is exhausted and we can no longer furnish them.

All new subscribers remitting one dollar before Dec. 15 will receive the ARCHÆOLOGIST until 1895.

Remember that our exchange department is free to all subscribers. Send in your subscription and exchange notice.



Kukulkan Facade, Palace of Labna, Yucatan.

The Archæologist.

VOL. I. WATERLOO, INDIANA, DECEMBER, 1893. NO. 12.

THE RUINS OF LABNA, YUCATAN.

[BY MARSHALL H. SAVILLE.]

Buried beneath a tropical forest on the peninsula of Yucatan, are the remains of once stately cities, the ruins of which are as interesting as any existing in the world.

The early Spanish Historians were told that long before the Spanish Conquest "the country was so densely populated as to present the appearance of one great town". This is probably an exaggeration, though there can be no doubt that war and disease had depopulated the country to such an extent that many of the cities were abandoned and in ruins at the time of the invasion of the country.

The Mayas who inhabited the country were a people who had made considerable advance towards civilization. They made a valiant effort to rid the country of the invaders and from 1527 until 1542 the Spaniards were unable to effect a permanent settlement.

At this time Chichen Itza, the greatest city in Yucatan, was inhabited; and so too, in all probability, was Uxmal, which has the most magnificent buildings in the New World, though it was in a state of decadence and its former glory had departed.

To-day, not one of the ancient cities is occupied by the descendants of their builders, and on the site of a number of aboriginal towns are cities built by the Spaniards, largely from the materials obtained from the destroyed structures.

Moreover, all of the towns and cities of Yucatan are built on, or near, ruined cities.

The whole surface of the country so far as we know is covered with mounds and half ruined edifices seemingly verifying the account of the historians regarding its former dense occupation.

John L. Stephens visited Yucatan in 1840 and his volumes entitled, "Incidents of Travel in Yucatan," have long been read with unflagging interest and will always continue to be the best popular account of the marvelous ruins.

Many of the places described by Stephens have probably not been visited by foreigners from that time to the present, although a number of other cities have been brought to light by later explorers. Probably, there are others awaiting the coming of the archæologist to break the silence which has hung over them for centuries.

In several of the ancient cities excavations have been made, notably in Chichen Itza, Uxmal and Labna, but as yet no exhaustive research has been carried on in any one locality.

The most famous ruins which have been visited by travellers and are best known, are Chichen Itza, Uxmal, Kabah, Izamal and Ake.

Labna, from the time of Stephens' visit until within six or seven years, remained unvisited by foreigners. At that time, or to be exact, during the winters of 1889 and 1890, an expedition under the auspices of the Peabody Museum of Harvard University, Cambridge, Mass., made extensive clearing around the ruins and a survey of the principal structures was made. From this survey a map has been drawn which has not yet been published, This map is by no means complete, as none of the outlying structures are included.

It is, however, the only map of any of the ruined cities of Yucatan made from a survey by a competent civil engineer.

The ruins of Chichen Itza, Uxmal, Kabah, Ake, Izamal, Labna and Sebetche have been photographed by Charnay, LePlongeon, and by H. N. Sweet for the Peabody Museum, but the cost of clearing the forest which has overgrown the ruins has prevented the photographing of the more remote structures. Another obstacle to the spread of our knowledge of this region arises from the hostility of the Mexican Government to the prosecution of archæological investigation within their territories by foreigners.

So particular are they upon this point that the removal of specimens out of the country is forbidden by law.

Mexico has, as yet, undertaken no archæological examination of any of the ruined cities of Yucatan. Hence it is, that ancient Yucatan, with its ruins, cemented roads, deserted village sites and tombs is comparatively unknown and offers an inviting field to the archæologist.

In some of these tombs have, unquestionably, been buried the precious codices similar to those the priests so ruthlessly burned at the time of the Conquest.

The great unexplored portion of Yucatan is called the "tierra de los sublevados." It extends from the central part of the peninsula southward to the Guatemala boundary.

Stephens made a journey into the region and found interesting remains but spent little time there. No archæologist has made the journey since that time.

The eastern part of the peninsula is almost wholly unknown. The Chan Santa Cruz Indians dwell on the eastern coast near the ancient city of Tuloom and have never been conquered by the Spaniards. They are governed by a "cacique" and are deadly enemies of the Yucatecans, making incursions to the frontier towns and carrying away captives into their own territory.

It is quite probable that they still have traditions relating to the ruins and may still keep up ancient rites.

They have no communication with the Spaniards, doing their trading with the English at Belize. These Indians offer an unexcelled opportunity for study by the ethnologist and undoubtedly would add an interesting chapter to our knowledge of ancient America.

The ruins of Yucatan are similar in many respects to those found in Chiapas, Tobasco, Eastern Guatemala and northern Honduras, and the hieroglyphic inscriptions are for the most part identical.

The greatest field in American Archæology today is the deciphering of these inscriptions and unraveling the mass of symbolism seen on the buildings and monuments.

The ruins of Labna, although less known than Chichen Itza and Uxmal are nevertheless extremely interesting; they are situated about twenty miles southwest from Ticul on the Hacienda of Tabi. This hacienda is under the management of the enlightened gentleman Don Antonio Tajado, the friend of all American travelers. Within the domain of this hacienda are several small groups of ruined structures, and also the ruins of Sebetche with its wonderful well, Chun Katzin and the Cave of Loltun.

The Labna ruins are in a valley about two miles in diameter entirely surrounded by low lying hills. The hills and valley are covered with a dense tropical forest, in which the jaguar and puma prowl, making their homes in the rooms of half destroyed buildings. The principal groups of structures are approximately in the center of the valley.

Entering the valley from the north we first come to the Palace of Labna. This old edifice is one of the largest in Yucatan. It is built on a terrace and shows a number of periods of construction. It faces south but is not orienated. The lower part of the structure is composed of three wings, the total length of which is three hundred and seventy-five feet. These wings show four periods of construction, and many of the rooms are yet as comfortable living quarters as can be found in Yucatan today, the writer having lived several months in one of them.

On these wings three smaller structures were erected. At the extreme eastern end of the eastern wing was formerly another wing extending north at right angles to it. The rooms of this wing are totally destroyed.

A long unornamented building runs south from the western end of the middle wing leaving only a passage way between the two structures.

The eastern wing is thirty-five feet in front of the middle wing and the facade of the rooms connecting the two is one of the most interesting in Yucatan.

Over the doorway at the center of the facade is a great symbolic face with an immense nose curling upward; on the sides and under part is an inscription, the hieroglyphs composing it being similar to those of Chichen Itza, Palenque and Copan. The two glyphs of the inscription on the under part are 13 muluc, 5 xul—muluc being the name of one of the four days with which the Maya year always commenced and xul the sixth month of the Maya calendar. The nose is undoubtedly the serpent emblem of the long-nosed god, Kukulcan or the Feathered Serpent God. The flumes as seen in later representations are missing and this may be an archaic type of the god.

Near each side of this face had formerly stood small statues which are now mostly destroyed. About fifteen feet south is the southwestern corner of the facade of the eastern wing. This is ornamented with a curious face which is shown in Stephen's Incidents of Travel in Yucatan, Vol. 2, p. 56.

This has the curling, uplifted nose with four dots on each side. In place of the mouth is the open jaw of a serpent or alligator in the upper part of which is a human face. Incorporated in the facades of the middle and western wings are a number of grotesque faces with the so-called "elephants trunk" nose. Most of these noses have been broken off but several remain intact.

This peculiar nose is seen on many of the buildings of Yucatan and from its appearance arose the myth that the ancient Mayas must have been acquainted with the mastodon or elephant. It is however, simply an exaggerated nose and may perhaps be the serpent symbol of Kukulcan.

The upper buildings were reached by a flight of steps built against the facade of the eastern wing near the western end. These steps are now in ruins and the debris partially fills the entrances of two of the rooms.

All of the rooms of this edifice have the triangular arch which runs parallel with the facade; they are about twice as long as they are wide.

One of the rooms of the eastern wing has a door-way in the back wall leading into a rear chamber lighted only through this doorway. Back of this rear chamber is another which has no doorway and is entered by a circular opening through the roof. This chamber is of the same shape of the others and might have been used for storing corn.

None of the ancient buildings of Yucatan have windows; all light entering through the doorways.

The doorways of the Palace are small, being a little over six feet in height and they have stone lintels. The white cement which once overspread the entire building still covers a portion of the walls of the rooms, and on either side of one of the doorways may still be seen the mysterious red hand painted on the cement. This was observed by Stephens in many of the ruined structures of the country.

This remarkable structure or series of buildings had formerly more than fifty rooms. Although the building was of irregular shape it must, when Labna was the metropolis of the district and teemed with life, have presented an imposing appearance.

In the terraces on which the palace was built are several subterranean chambers called in the Maya language, "chultuns." These are bottle-shaped, the entrance being about the size of a barrel, and about twelve or fifteen feet in depth and eight to ten feet in diameter. These chultuns were the resevoirs of the country, there being no rivers or lakes on the surface of Yucatan. The water supply now, as in ancient times, is wholly from cisterns and underground rivers, which rising enter caves near the surface, flowing in at one end and out at the other; these are called cenotes. The wells also strike these underground rivers or lakes and afford a never failing supply of water

Running south from the western end of the terrace in front of the eastern wing of the Palace are the remains of a cemented road averaging twenty-five feet in width and about four feet above the level of the ground.

Vegetation has destroyed this causeway so that it now presents the appearance of an immense stone wall, in which can be seen, here and there, pieces of cement. It is about 600 feet long and terminates at the base of a mound or what may also have been a cemented road. This extends between the pyramid upon which stands the Temple and the front of the famous Portal. The Portal of Labna has been viewed by multitudes of World's Fair visitors through the full size representation which stands in front of the Anthropological Building at the southern end of the grounds.

This remarkable building was constructed under the personal supervision of U. S. Consul E. H. Thompson, whose long residence at Yucatan and explorations of the ruins for the Peabody Museum, eminently fitted him for the undertaking. It is an accurate representation, and is the first attempt to reproduce, on a large scale, any of the structures of Yucatan.

This portal has the triangular arch and is nearly surrounded by buildings, built from either end of the Portal. At the northwestern corner of this group was a passage or alley leading out of the yard. Most of these buildings are now destroyed only those nearest each end of the Portal remaining. This style of building is seen at Uxmal on a larger scale, the House of the Doves having been a series of buildings joined together around a square courtyard, the entrance being through a triangular arched doorway in the northern building.

The House of the Nuns, also, is composed of a series of four buildings grouped around a square, the entrance to which being through a triangular arched doorway through the center of the southern building.

The Temple of Labna is directly east of the Portal Group and is built upon a pyramid about fifty feet high. The terraces of the pyramid have been destroyed by vegetation and the steep sides are quite difficult of ascent. The view obtained from the highest portion of the Temple is magnificent. The valley is surrounded by hills and in the background as far as the eye can reach their undulations continue.

The entire surface of the country is covered with forests: and turn in whatever direction you will, not a break can be seen in this covering of verdure. Immediately to the south and west no white man has ever penetrated beyond the first range of hills: and who can tell what gems of ancient architecture lie buried in the wilderness, or if at our very feet may not be tombs containing the priceless manuscripts, the possession of which might prove a clue to the mysterious hieroglyphs which have so long baffled the researches of Americanists!

The Temple is a building of several chambers; it faces the south, and the northeastern end is demolished. The front wall is continued above the roof about the same height as the building. It is about one and a half feet in thickness and has numerous squared openings extending through it in regular order. The eastern end has a long fissure extending from the top of the wall downward through the building to the ground. This was observed by Stephens when he visited the place fifty years ago, and he lamented that it must fall in a few years, yet it stands today as it did then and bids fair to stand for centuries longer. The upper wall is not made of cut stone as is the building, but is composed of small rough stones, strongly cemented together and covered with thick cement or stucco. The southeast corner has several stones projecting which formerly served as pedestals for stucco figures. The lowest one which is at the corner of the building about ten feet above the ground, has still a figure standing upon it minus the head and shoulders.

Above the eastern doorway is the head and upper part of the body of a human figure made of stucco. The features are well modeled, the right shoulder is missing but the left is covered with a cape which comes down a little above the elbow.

The figure was formerly painted and in the less exposed surface can be seen traces of red, yellow, blue and black paint. Probably a corresponding figure was placed over the western door, but it has disappeared. The remains of a number of stucco figures can be seen on the rising wall above, which also show traces of paint. The most notable one is situated high above the figure with a cape: this represents a person kneeling, the body slightly bent forward. Opposite is another figure with one knee bent in front. The head of the kneeling figure has fallen but above the place which the neck occupied is a globe partially supported by the hands of the person opposite. On the outskirts of the main group of the buildings and extending to the base of the hills, are scattered the house sites of the common people who probably built them as the Mayas do now, in thatched roof huts, the walls often being built of adobe or sundried mud.

Excavations among these house sites reveal the presence of the three stone fire-place or koben which is still used by the Mayas—a clay griddle being placed over it for baking tortillas.

On the summits of all the hills surrounding Labna are the remains of solitary buildings which once served as watch towers or temples. The sides of the hills show the remains of terraces which were probably utilized for gardens.

Explorations at Labna as well as in other places in Yucatan and Central America have shown that the stone used in the construction of the buildings was quarried and transported in the rough, to the place where the building was to be erected. It was then cut in the required shape and the chips used with cement to fill in the space between the inner and outer faced wall and in the construction of the roof.

Stone chisels were used in dressing the stone and in proof of this a number of these implements have been found on the ancient quarry sites.

The cement used was the saccab, (white earth) a natural, decomposed lime rock, which is found in abundance throughout Yucatan.

The priests and nobility who lived in the stone edifices, were usually buried in small chambers or tombs beneath the floors of the buildings. A number of these tombs have been opened, and it was found that they were made when the buildings were constructed. They are made with stone or cemented floors, walled sides, and with flat slabs of stone placed over the top. The floor above was always macadamized and covered with cement to the depth of several inches.

When a person died the floor was torn up and the remains were placed in the tomb after which the floor was repaired and no evidence of its having been disturbed could be seen. These tombs are small and the body must have been doubled up in order to place it in the vault.

Sometimes two tombs were made under the same floor, and several have been found empty, with nothing to show that any burial had ever been made in them.

Vases and personal ornamens such as beads and amulets were usually placed with the body but no textile fabrics have yet been found. The bones are usually in such a condition as to be of little use to the anatomist. The tombs that have been found at Labna are air and water tight, and consequently the decay of the bones indicates considerable antiquity.

It is probable that each city had places set apart for the burial of the common people, but such burial places have, as yet, never been found, and the chances of ever finding them are slight because of the ravages of ants.

The approach to a representation of the Greek Atlas on the Temple facade must not be taken as evidence of connection or influence from the "Old World".

The "Greek fret" is found in the facades of many of the buildings of Yucatan. The triangular arch was used in Cambodia, Asia, and the buildings there show great similarity to those of Yucatan. Cross legged figures very closely resembling the archaic type of Buddha are not uncommon and would unquestionably be mistaken for carvings from India, if seen in a museum, unlabelled. Moreover the worship of the Serpent is found to have prevailed as largely in Central America as in India. Phallic worship as in India, Egypt, Greece and Rome was probably practiced here and buildings ornamented with Phallic emblems once existed in Uxmal, Labna and Copan.

Sun and fire worship also had their share in the religious thought of the ancient Mayas. Many resemblances to the art of ancient Egypt have also been noted. Yet even with the light of recent discoveries, no single point can be conclusively proved to have been the result of tradition or of foreign influence. In fact, more intimate knowledge of the antiquities of Central America and Yucatan, leads us, inevitably, to the conclusion of an indigenuous civilization, uninfluenced by any of the historic nations.

The many curious similarities simply showing that the human mind works practically in the same channels the world over, arriving at certain stages of religious thought sooner or later. This evolution of the religious idea among the ancient Mayas will no doubt be traced in the symbolic carvings on monuments and buildings when a more complete comprehension of their meaning is worked out.

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THE OHIO LLAMA.

[BY J. F. SNYDER, M. D., VIRGINIA, ILL.]

One autumn day, several years ago, when the tide of migration of people from the middle states to Kansas and Nebraska was at its height, a "mover" from the east stopped his team at the hitching rack on our public square to obtain some necessary supplies and make the usual inquiries about the distance to the Illinois river, and the most direct route to the nearest crossing place of the Mississippi beyond. The man's team and covered wagon were in fair condition, with dusty evidence of long continued road service, but not materially differing from similar outfits that daily traversed our streets westward bound. The wagon, followed by a couple of dogs, contained the usual equipment of bedding, clothing, and cooking utensils, together with four children and their mother in somewhat squalid attire. The man himself was apparently middle-aged, tall, lean, roughly dressed and illiterate—a fair type of the western bee-hunter, a race now almost extinct. Wanting medicine for a sick child he was directed to my office. On my table were lying, as was—and is—often the case, several stone implements of the prehistoric Indians that I had recently received. These attracted his attention and he asked me if I "paid anything for such rocks". I informed him that I did sometimes when I could not get them as gifts. He then told me that in leaving his old home in Ohio, to find a new one in the west, his children had gathered up a lot of Indian relics that had been around the house for some time and had put them in the wagon; and, if they were still there, he would sell them if he could get anything for them.

Since starting out from Ohio, he said, he had met with bad luck that delayed his progress and well nigh exhausted his slender means. One of his horses had died and he had to buy another one to replace it; and then he "had to lay by a right smart spell on expenses" on the account of the serious sickness of a child then hardly convalescent. I went with him to his wagon, and, while I examined the little invalid, he rummaged about the wagon until he finally drew out a dirty little sack, the contents of which he emptied on the wagon seat. Besides dirt and a few common water-worn pebbles the collection comprised three ordinary grooved axes and two celts of greenstone, a rude discoidal stone, several arrow and spear points and scrapers of flint. pieces of broken pottery and the image of the Llama represented by Fig. 1, drawn in half of its actual size, which, he explained, was "a pipe. like a deer, that they hadn't finished", and depreciated in value in his estimation because unfinished. My familiarity with the books of travel of Von Tschudi and Rivera. of Ewbanks and Herndon and Gibbon, and others, in Peru, enabled me at a glance to recognize in this "unfinished pipe" a rare and valuable archæological specimen, and I bought the lot without hesitation.

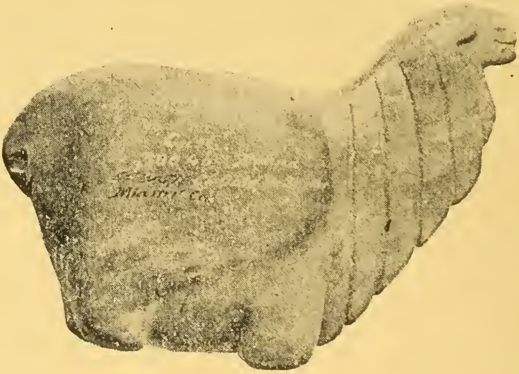

Fig. 1.

Actively engaged at the time in pursuits that demanded all of my time and attention to the exclusion of amateur scientific studies. I overlooked the importance of acquiring from the man the exact details of this discovery that would enable me in future to verify his story. In my eagerness to secure the Llama it did not occur to me to ask his name, or to inquire the precise locality in Miami county in which he had resided, or what particular portion of the west was his intended destination.

He said he was a native of Ohio and had lived since his marriage on a small farm not far from the Miami river, and that these relics, with the exception of the Llama, several arrow-points, one of the celts and the fragments of pottery, had been picked up by himself and the children in the "washes" and fields about his place. There was in his field a low flat mound that had been plowed over ever since the place was first cleared of timber. Last spring when "breaking his corn ground" in passing over this mound the plow turned up some human bones including part of a skull. Prompted by curiosity he got his is spade and dug down a foot or more, for the space of two or three feet around, and found, with more of the human skeleton, that fell in pieces on handling, the Llama and other objects mentioned.

This comprises absolutely all that is known of the discovery of this strange exotic relic of a still stranger and unknown race.

This man was a fair type of the poor and shiftless small farmers and tenants common to all parts of the west. He had probably spent the greater part of his time in fishing and hunting, or idling; and his wagon and horses represented no doubt the product of his labor for years. He could neither read nor write. The idea of practicing fraud, or counterfeiting remains of antiquity could never have occurred to him, for he had never before thought that genuine relics of aboriginal art had a market value. The modest price he placed upon the specimens, and the simplicity of his language and manners, and evident illiteracy, had all the elements of honest candor, leaving no room or reason whatever to doubt the strict truth of his narrative.

This unique object, fairly well represented in the accompanying cut, Fig. 1, was, beyond all reasonable doubt, fashioned by a native artist of Peru during the reign of the Incas. It is remarkably well proportioned and finely polished, cut out of hard quartzite of variegated dull colors, so that the head and upper part of the neck and body are yellowish brown and the rest nearly white. Its extreme length, from nose to tail, is five inches; its head is three and three fourths inches high, and its back two and three fourths inches; and its thickness, or width from side to side, is rather more than an inch and a half. The excavation in its back, which widens out below the orifice, is five-eighths of an inch in diameter at the surface enlarging to seven-eighths, and is one inch in depth.

Images in stone of the Llama and its relatives, similar to this one, were seen in Peru at the beginning of the present century by Humboldt and Bonpland, and forty years later by Von Tschudi. In the report of Mr. Thomas Ewbank, who accompanied, as naturalist, the U. S. Naval Astronomical Expedition to the southern hemisphere, under command of Lieut. Gillis, in the years 1849 to 1852, he presents the cut, also reproduced in the Appendix of his Life in Brazil, of which Fig. 2 is a copy, with a brief description of each object figured. Figure "N" in this collection of twneny-one that he saw was carved of hard wood with plugs of gold representing the eyes. All the others were shaped of stone of different degrees of hardness, and all had, as mine, the cavity in the back, shown by the dotted lines, slightly enlarging below the orifice.

For what purpose these strange effigies were made, and how used, is unknown. A variety of conjectures have been advanced to solve the problem of their utility; but they still remain as inscrutable an enigma as was the purpose of the discoidal stones found in this region.

Mr. Ewbank thought they were mortars, and, in support of this idea, says: "The Peruvians used tobacco in the form of snuff. They also prepared the leaves of the coco and other plants for medical purposes by grinding; hence the demand for small mortars." Their use as salt-cellars has been suggested.

Von Tschudi remarks: "Under the dynasty of the Incas the Peruvians rendered almost divine worship to the llama and his relatives, which exclusively furnished them with wool for clothing, and with flesh for food. Their temples were adorned with large figures of these animals made of gold and silver; and their forms were represented in domestic utensils of stone and clay. In the valuable collection of B. C. Von Hagel, of Vienna, there are four of these vessels, composed of porphyry, basalt and granite representing the four species, viz: the llama, alpaca, guanaco, and vicuna. These antiquities are exceedingly scarce, and when I was in Peru I was unable to obtain any of them. How the ancient Peruvians, without the aid of iron tools, were able to carve stone so beautifully, is inconceivable."

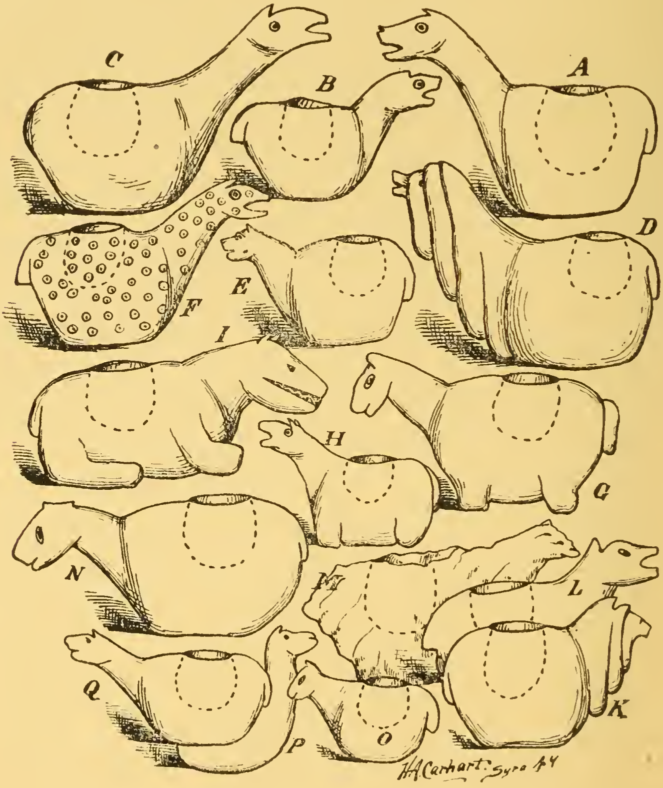

Fig. 2.

Lieut. Lardner Gibbon, in his report of the exploration of the Valley of the Amazon, 1854, figures, on page 60, one of these stone llamas, almost the counterpart of my Fig. 1, that he saw at Cuzco, and calls it a "drinking cup!"

In the great work on Peru, by M. Rivera, he also figured almost a fac simile of Fig. 1. and says, in suggesting the probable use of this class of Peruvian antiquities: "Elles servois pour les sacrifices en honneur des llamas et pakochas; selon d'antres ecridaines elles servarent pour payer le tribut en or, qui chaque citoyen de l'empire des Fanantinsoyos etair oblige a payer en retour du chaque annie." His first guess, that they were used in sacrificial ceremonies in honor of the llama, has many elements of plausibility, much more so than the notion that they were measures for collecting taxes in gold dust.

So far as I have been able to ascertain, all the llama effigies of this class have been found buried with the dead within the limits of the empire of the Incas.

In the great collection of Sig. Emilio Montes, of Peruvian antiquites, exhibited in the Anthropological building at the late Columbian World's Fair, was the surprising number of one hundred and ten of these llama images, ranging in size from an inch and a half in length and height to thirteen inches, and carved from almost every variety of stone. Granite, diorite and basalt were the materials from which the greater part of them were cut; some were made of translucent quartzite, others of variegated jasper, and all were highly finished and polished and admirably proportioned. In the most of them the cavity in the back was of the dimensions outlined in those represented in Fig. 2: in many the cavity was larger, and in a few it was almost commensurate with the entire body of the image and polished within to the highest degree of perfection.

There were six others of these quaint objects in the Dorsey collection of Peruvian relics, in the Anthropological building, of the same general form, but small, some broken, and, as seen through the glass of the case, apparently made of dark terra cotta. They too were exhumed from ancient graves in the rainless regions of western Peru.

There can be no question of the Peruvian origin of the specimen in my collection, represented by Fig. 1. Then granting the account of its discovery in the Ohio mound to be true—and we have no reason to doubt it—how are we to account for its presence there?

The hypothesis has been advanced, to answer this inquiry, by a distinguished scientist, that possibly in the remote past there yet existed in the southwest, at the first advent of the Mound Builders on this continent, a few living individuals of the now extinct Procamelus, or Plianchenia, or Holomeniscus, or some of the other huge llama-like animals whose fossil remains have been found in the Miocene and Pliocene formations of Texas and New Mexico; and that this stone image is the reduced copy, by a primitive artist, of a living model. This supposition is obviously untenable. Neither the domestic llama of Peru, or any species of the genus Anchenia, ever existed in North America: and their allied genera whose remains are entombed in our Miocene beds were certainly all dead, ages before even mythical pre-glacial man made his appearance in New Jersey.

This Ohio llama image is certainly an exotic. This must be admitted; but, a learned friend, one of the curators of the National Museum at Washington, is skeptical as to the extreme antiquity of its introduction into the interior of Ohio. There are many ways, he argues, by which its presence there can be accounted for by modern agencies. For instance, in the early settlement of the Miami valley a house may have been built on this identical mound.

The stone image, brought to this backwoods residence by a traveler in foreign lands, in time was lost by dropping through the floor; then, in the years following the house disappeared by fire, or the slower process of decay. Then trees grew up on the place it occupied, and the stone gravitating down to the remains of the buried Indian beneath lay there awaiting a future discoverer.

A much more ingenious theory, to explain the mode of transit of this Peruvian relic from its original home beneath the equator to the wilds of Ohio, was suggested by the lamented Dr. Chas. Rau, former Curator of Antiquities in the Smithsonian Institution. He thought it probable that the stone image may have been secured in Peru by some one of the Spanish adventurers, while desolating the realms of Manco Capac under command of that bloodthirsty scoundrel, Francisco Pizarro, and the same soldier, still having the same stone in his knapsack as a talisman, afterward engaged in one of the many expeditions of that time into Florida, as all the territory north of the Gulf of Mexico was called, where he met his death, perhaps in some Indian foray, and his effects passing into the possession of the dusky natives, found their way, in the course of barter, or war, or migration, to the banks of the Miami.

But why strain the imagination for improbable means when the most ready and natural solution—based on well known facts and analogies—will better answer every requirement of the case?

When the eminent scientist, Alfred Russel Wallace, a few years ago, visited the collections of the Smithsonian Institution, the plaster cast of my Ohio llama at once attracted his attention, as his knowledge of Peruvian antiquities caused him to recognize it as a stranger far from home. For its history he was referred, by the curator, to me, and immediately wrote to me for the information. In answer I communicated to him all the facts of its discovery, as narrated in this paper, together with the opinion of Dr. Rau of the manner of its transmission to this region. In a short time I received this courteous acknowledgement of the receipt of my letter, containing, from such high authority, corroboration of the view I had from the first entertained in the discussion of this matter:

"THE HAMILTON, WASHINGTON,

MARCH 4th 1887.

DR. J. F. SNYDER,

DEAR SIR:—Many thanks for your interesting letter which is just what I wanted. The authenticity of the specimen appears to be perfectly established; but Dr. Rau's theory seems improbable and unnecessary. There was undoubtedly intercommunication, more or less frequent, between peoples of the two continents in early times, and this is one of the indications of it. I had seen the figures your refer me to (Ewbank's), some of which agree exactly with your specimen. Believe me; yours very truly, etc.,

ALFRED R. WALLACE."

In this little work of art of the Inca people of South America, found buried with the skeleton of an Indian in western Ohio, there is nothing much more wonderful than the finding of the copper plates of undoubted Aztec design and make at the base of the Etowa mound in Georgia: or, of the shell gorget, bearing the same Aztec figures, taken from a mound in New Madrid Co., Mo.: or of the shell gorgets engraved with emblems, marvelously similar to the bas-reliefs of Central America, found in the McMahon mound at Sevierville, Tenn.; or, of the two hundred splendid obsidian blades. and finely-cut and molded coppers, evidently of early Mexican manufacture, found in the Hopewell mound, Ross Co., Ohio, by Mr. Moorehead. The surprising finds of this class are only proofs of the more extended commercial relations existing among the early and widely separated tribes of America; or, if taken as reprisals in war instead of by peaceable barter, they are merely silent but astonishing witnesses of the amazing distances to which predatory Indian excursions were sometimes carried. Scarcely two centuries ago the fierce Iroquois of northern New York marched hundreds of miles in the midst of rigorous winter to punish and plunder their enemies on the Illinois river, and after slaughtering them without mercy returned to their haunts with the tangible fruits of their valor. In yet earlier times, long before Lief Ericison coasted the rocky headlands of Maine, we know that aboriginal trade, or reprisals, perhaps both, were coextensive with—and exceeded—the limits of the Mississipi valley. The Georgia Indians were supplied with pipestone from Minnesota and copper from Lake Superior: the tribes inhabiting the region between Little Rock and Toledo had ornaments and implements made of catlinite and copper from the far north, of mica from the distant east or west, of obsidian from Mexico, and marine shells from the Atlantic seaboard and the Gulf of Mexico. The stone-grave denizens of the Cumberland valley had acquired from the cliff-dwellers of Arizona the artificial compression at the occiput of the cranimus of their male infants. And the semi-sendentary Indians, living in pallisaded towns, that De Soto encountered in the south, had learned the use of salt and obtained corn, pumpkins, and the art of making feather cloth from the seven cities of Cibola. These facts considered, the transmission of the llama image, from the purlieus of the Temple of the Sun or the coast region of Africa, by trade, war or migration, to the stone-built cities of Copan and Palenque, and thence, by the same agencies, to Mexico, and finally to the habitat of mound building Indians in the valley of the Oh io, becomes a problem presenting but few difficulties to its ready solution.

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"THE GIANT CLOUD-SWALLOWER."

A ZUÑI TALE OF THE CAÑON DE CHELLY.

Introductory.

Deep down in cañons of the Southwest, especially where they are joined by other cañons, the traveler may see standing forth from or hugging the angles of the cliffs great towering needles of stone, wierd, rugged, fantastic, oft'times single as often,—like gigantic wind stript trees with lesser trees standing beside them,—double or treble. Seen suddenly at a turn in the cañon these giant stones startle the gazer with their monstrous and human proportions. Like giants, indeed, at bay against the sheer rock walls protecting their young,—who appear anon to crouch at the knees of their fathers or cling to their sides.

Few white men ever behold these statuesque stones in the moonlight, or in the gray light and white mists of the morning. At mid-day they seem dead or asleep while standing. But when the moon is shining above them and the wanderer below looks up to them, lo! the moon stands still and these mighty crags start forth, advancing noiselessly! His back is frozen and even in the yielding sand his feet are held fast, by terror—a delicious ghostly terror withal! Still he gazes fascinated, and as the shadow of the moonlight falls toward him over thetopmost crest, lo again! its crown is illumined and circled as if by a halo of snow light and forth from this luminus fillet over that high stony brow black hair seems to tumble and gather.

Again, beheld in the dawnlight, when the mists rising slowly and are waving to and fro around the giddy columns, hiding the cliffs behind them, these columns seem to nod and to waver or to sway themselves backward and forward, all as silently as before. Soon, when the sun is risen and the mists from below fade away, the wind blows more mist from the mesa—you see clouds of it pour from the cliff edge just behind and above these great towers, and shimmer against the bright sky,—but as soon as these clouds pass the crag-crests they are lost in the sunlight around them—lost so fast as yet others come on, that the stone giants *do* seem to drink them!

Of such rocks, according to their variety and local surroundings, many tales are told by the Zuñis—tales which are so ingenious and befitting that if we believed as the Zuñis do, that in the time of creation when all things were young and soft and were therefore easily fashioned by whatever chanced to befall them—into this thing or that thing, into this plant or that plant, this animal or that, and so on endlessly through a dramatic story longer than Shakespeare or the Bible—we would fain believe also as he does, in the quaint incidents of these stories of the time when all things were new and the world was becoming as we see it now.

One of these tales, a varient of others pertaining to particular standing rocks in the West, South or East, is told of that wonder to all beholders—"*El Capitan*" of the cañon de Chelly in the north. No one who has seen this stupenduous rock column or the superb transparency of it by Hillers, which adorned the middle window of the U. S. Geological Survey exhibit in Government building at the World's Columbian Exposition, will fail to be interested in the following legend, or will fail to realize how, as this introductory endeavors to make plainer, the Zuñi poet and philosopher, of olden times, built up a story which he verily believed quite sufficient—to account for the great shaft of sandstone and it's many details and surroundings.

We might, if we would, learn a lesson, archæologic and historic alike, in this story, that the tales of Giants *and* Monsters told in the lore of all peoples were but partially founded in fact, and that fact or half foct, more analogistic than realistic, mere untutored speculation to account for the flows of black lava as the clotted dry blood of slain giants, great mimitic shapes in rock, as monsters changed to stone, fossil bones of mammoths and reptiles as the skeletons of Man eaters, drowned or burned in the deluges or fire-blasts of avenging Gods when men were still their children.

Thus, Then, Runs the Story.

Hä-ki Suto, or Fore-top Knot, he whose hair—like a quail's crest—was done up over his forehead, lived among the great cliffs of the north, long ago, when the world was new. He was a giant, so tall that men called him Lo Ikwithl–tchu no–na, or the Cloud Swallower. A devourer of men, was he,—men were his meat; yea, and a drinker of their very substance was he, for the cloud-breaths of the beloved Gods, and Souls of the Dead, whence descend rains, even these were his drink! Wherefore, the People of the Cliffs sought to slay him, and hero after hero perished thuswise. Wherefore, too, snow ceased in the North and the West; rain ceased in the South and the East. The mists of the mountains above were drunk up. The waters of the valleys below were dried up. Corn withered in the fields. Men hungered and died in the cliffs.

Then came the Twain Gods of war, Á-hai–yu-ta and Mé-tsai–le-ma, who in play, staked the lives of foes and fierce creatures!

"Lo it is not well with our children, men," said they, "Let us destroy this Hä–ki Suto, the swallower of clouds," said they.

They were walking along the trail which leads South to the Smooth-rocks-descending.

"Oh, grandchildren, where be ye wending?" said a little, little quavering voice. They looked,—the younger, then the elder. There on the tip of a grass-stalk waving her banner of down-stuff stood their grandmother, Spinner of meshes.

"The Spider, our Grandmother Spider," said one of the gods to the other.

"Ho! grandmother, was that you calling?"

Yea, children, where wend ye this noon-day?"

"A warring," said they, "we are going. Look now!

"No beads for to broider your awning
"Have fallen this many a morning."

"Aha! wait ye! Whom ye seek verily I know him well!"

"Like a tree fallen down from the mountain
He lies by the side of the cliff-trail
And feingns to sleep there, yet is wary.
I will sew up his eyes with my down-cords.
Then come ye and smite him, grandchildren!"

She ran ahead. There lay Hä–ki Suto, his legs over the trail where men journeyed. Great, like the trunks and branches of pine trees cast down by a wind storm, were his legs arching over the pathway! And when some one chanced to come by, the Giant would call out "Good morning!" and bid him pass "right along under". "I am old and rheumatic," he would say, oh, so politely! "Do not mind my rudeness, therefore: run right along under; never fear, run right along under." But when the hunter tried to pass, kúutsu! Hä–ki Suto would snatch him up and cast him over the cliff to be eaten by the young Fore-head-cresters.

The Spider stepped never so lightly, and climbed up behind his great ear, and then busily wove at her web, to and fro, up and down, in and out of his eye-lashes, she busily plied at her web.

"Pesk! the birds and buzz creatures!" growled the Giant, twitching this way and that, his eye brows, which tickled; but he would not stir,—for he heard the war gods coming, and thought them fat hunter, and needs must feign sleepy.

And these, ha! ha! They began to sing, as was their fearless wont sometimes. Hä-ki Suto never looked, but yawned and drawled as they came near, and nearer: "Never mind, my children, pass right along under, pass right along under. I am lame and tired this morning."

Á–hai–yu–ta ran to the left, Má-tsai–le-ma ran to the right. Hä–ki Suto sprang up to catch them, but his eyes were so blinded with cob-webs that he missed them and feigned to fall crying, "Ouch! my poor back! my poor back! Pass right along under, my children, it was only a crick in my back, ouch! Oh, my poor back!" But they whacked him over the head and stomach till he stiffened and died. Then shouting, "So ho!" they shoved him over the cliff!

The Novajos say that the Grandmother tied him there by the hair—by his top-knot—where you see the white streaks on the pillar, so *they* say; but 'tis the birds that streak the pillar, and *this* is the way. When Hä-ki Suto fell, his feet drave far into the sands, and the storm-gods rushed in to the aid of their children, the war gods, and drifted his blood-be-drenched carcass all over with sand, whence he dried and hardened to stone! When the young ones saw him falling they forthwith flocked up to devour him, making loud clamor. But the twain seeing this made after them too and twisted the necks,—of all save only the tallest who was caught in the sands with his father,—and flung them aloft to the winds, whereby one became instant the owl, who twists her head wholly around, whensoever she pleases, and stares as though frightened and strangled; and another, the falcon became, who perches and nests to this day on the crest of his sand-covered father, the Giant cloud drinker. And the falcons cry ever and ever "'Tis father, oh father!" (Tí-tätchu ya tätchu.)

But fearing that never again would the waters refreshen their cañons, our ancients who dwelt in the cliffs fled away to the southward and eastward, all save those who had perished aforetime. *They* are dead in their homes in the Cliff-towns, dried, like their cornstalks that died when the rain stopped, long, long ago, when all things were new.

Rendered by FRANK HAMILTON CUSHING.

U. S. BUREAU OF ETHNOLOGY, NOV. 7, 1893.

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THATCHER'S SYSTEM OF AWARDS AT THE CHICAGO EXPOSITION.

In former Expositions, the system of awards was founded on competition between the various exhibits, and prizes only awarded to those esteemed the best. There were various objections urged against this system. Sometimes through ignorance or favoritism or intrigue, prizes and medals were awarded where they should not have been. In order to avoid these and other objections, Mr. Thatcher devised a scheme by which the element of competition was eliminated. The Judges were to be experts who should deal solely with objects within their line: there should be no prizes and no grades of medals, while the various exellences and merits of the exhibit should be brought out in the Diploma which was to be noted in written or printed words and certified in the Diploma. In this way Mr. Thatcher believes that every object having a point of merit or degree of excellency, could be specified and rated at its true worth. According to his system, the Diploma should certify these merits and excellencies for each exhibitor or exhibit in each class. but there should be but one medal, that of bronze, so as to be distributed alike to every one who received a Diploma. An exhibitor might receive many Diplomas for his different exhibits, but would receive only one medal. In this way, a dozen or a hundred objects might each receive an award for different points of merit or degrees of excellence; while under the old system it would be only the two or three best ones which would recieve prizes, and nothing would be said of the merits of the other exhibits. There are many things to be said for and against both systems. The opinions of exhibitors differed upon this subject and some of them, the French, were in favor of the old system, and, refusing to submit to the new, they, or their Commissioners, withdrew their entire exhibit from consideration by the jury.

Prof. F. W. Putnam, Curator of the Peabody Museum at Cambridge, was Chief of the Department of Ethnology, Department "M", at the Columbian Exposition. He was granted large amounts of money to make investigations and collections, to be displayed. The Government of the United States, also, through the State Department and the Latin-American Commission, made appropriations and sent collectors for the same purpose in their line, in the installation of which they were aided by the Exposition authorities. Mr. William Eleroy Curtis was originally Chief of these two departments and had charge of their installation at the Exposition. The Convent of La Rabida was his own conception and proved to be one of the most attractive exhibits. When the Report of the Committee of Awards on these exhibits came to Mr. Thatcher, it was remarked that all these awards were made in favor of "Prof. F. W. Putnam, Chief of Department M." the collector's name being mentioned only in parenthesis, as it were, for the identification of the exhibit. This Prof. Putnam said, was to give credit, not to himself personally, but to the Department of which he was chief, and of which the others were subordinates. This state of affairs coming to the knowledge of Mr. Curtis, he presented his protest, declaring that Prof. Putnam had naught more to do with the inception, construction or arrangement of the contents of La Rabida than he had with the Temple of Solomon. He also filed another protest on behalf of his subordinates,—collectors who had gathered material under him. Both these protests were allowed, and the awards made in favor of those persons whose labor, brains and good taste were represented in their respective displays, and not to the official functionary who stood at the head of the Department.

The following persons in the United States received awards for archæologic displays:

Peabody Museum of Archæology.	Plans of the Peabody Museum, Mass.
George Hunt. (Collector.)	Kwakiutl house: Families of Kwakiutl Indians: Eth. Coll. from Kwakiutl Indians.
E. H. Thompson. (Collector.)	Fac-simile of Ruins of Yucatan.
Harlan I. Smith.	Crania: Archæological Coll. from the Little Miami: Same from Saginaw Valley.
C. L. Metz. (Collector.)	Model of Clark's Earthworks, Ohio, or ("Hopewell Group"); Model of "Fork Hill Mound".
Mrs. Emma Patten. (Collector.)	Pioneer Log Cabin, Mass.
Lt. Roger Welles, Jr., U. S. Navy.	Eth. Coll. from Orinoco Tribes.

Myron Elles, Washington state. (Collector.)	Eth. Coll. from Puget Sound; Huntoleps Canoe and Puget Sound Canoe.
L. L. Bush, (Collector.)	Ethnological Collection from Shaol Water Bay.
I. Cowie, (Collector.)	Ethnological Collection from Sakatatchewan Valley.
Lt. R. E. Peary, U. S. Navy.	Eth. Coll. from North Greenland.
Ernest Volk, Trenton, N. J., (Collector.)	Skeleton in Re-constructed Grave; Archæological Collection from the Delaware Valley.
F. Boas, (Collector.)	Charts explaining application of the Laws of Chance to Anthropological investigation.
George A. Dorsey, Cambridge. Mass. (Collector.)	Collection of Crania from Peru; Earthenware and Wooden-ware Vessels; Pottery from Northern Peru: Contents of 100 Graves; Contents of 11 Graves: Garments, Implements, Weapons, etc.: Contents of 15 Graves: Contents of 5 Graves: Ruins and Burying Grounds of Ancient Peru: Pottery, Gold, Silver and Copper Implements; Garments, Clay Images, Looms, Spindles, etc.
G. M. West, (Collector.)	Ethnological Collection from Micmae Indians.
A. R. Tisdale.	Eth. Coll. from Amalecit Micmae Indians.
Jas. Deans, (Collector.)	Ethnological Collection from Queen Charlotte Islands; Haida House, etc.
Lt. W. E. Safford, U. S. Navy.	Eth. Coll. of Indian Garments from Jiveros and Japeros; Ethnological Collection Cloth from Quichun and Aymara Indians.
J. T. Holgate, (Collector.)	Ethnological Collection from Mohawks.
M. O. Cherry.	Eth. Coll. from Yacon Tribes.
Phillip Jacobson, (Collector.)	Eth. Coll. frow Bella Coola Indians.
Sheldon Jackson, (Collector.)	Eth. Coll. from Alaska.
Mrs. Morrison, (Collector.)	Eth. Coll. from Tsimshian Indians.
Warren K. Moorehead, (Collector.)	Archæological Coll. from Ohio.
Lt. F. A. Sawyer, U. S. Navy. (Collector.)	Garments of Amazon Indians.
D. W. Bertolette, (Collector.)	Ethnological Collection from Upper Paraguay River.
Otto Fisch, (Collector.)	Ethnological Collection from the Pacific Island.
....	Charts Illustrating the Growth and Development of Children.
....	Collective Exhibit from South America.
....	Reproduction of Mounds.
....	Collective Exhibit from Central America.
....	Collection of Crania of Races.
....	Crania.

State of New York.	Iroquois Village of Bark Houses; New York Mammals and Land and Water Shells; Land Shells; Fresh Water Shells: Colonial Exhibit, Hist. Collection.
State Hist. Society of Wisconsin.	Copper Implements (Archæological).
Missouri Hist. Society.	Archæology of Missouri.
C. N. Green.	Relics from Cliff Dwellings of Colorado, New Mexico and Arizona.
E. E. Ayer, Illinois.	Eth. Coll. from Tribes of North America.
D. B. Dyer.	Arch. Exhibit from Several Indian Tribes.
U. S. National Museum.	Model of the Pueblo of Mashongnavi, Ariz.
Herman Haupt, Jr.	Eth. of the Dakotas and Ojibways. Ills.
Tiffany & Co., New York City.	Archæological Collection.
Wm. E. Curtis, Washington, D. C.	Collective Exhibit in "La Rabida" illustrating the time of Columbus.
Antonio Apache.	Navajoe Saddle, Silver Bridle and Loom.
H. H. Hayssen, Wisconsin.	Collection of Historical and Indian Relics; Exhibit of Numismatics; Wisconsin Archæology.
University of Pennsylvania.	Clay Tablets, Seals, Jewelry and Pottery; Historical Exhibit; Objects from Flinders Petrie and Egyptian Exploration Fund; Funeral Objects and Illustrations of Glass, Pottery, and Bronze Industry; Roman Glass and Ancient Italian Pottery; Collection of Objects Illustrating Archæology of Valley of Delaware River; Collection of Charms, Amulets and Folk-lore; Collection of Japanese Toys Illustrative of Folk-lore; Objects Illustrative of Religious and Social Customs of Chinese in U. S.; Games and Playing Cards, etc.; Museum Works of Pennsylvania.
Prof. Frederick Starr, Chicago, Ill.	Photos of North American Indians; Finger-prints of N. A. Indians.
F. G. Logan, (Horatio H. Rust) (Collector.)	Archæological Exhibit.
F H. Cushing, Washington, D. C.	Zuñi Games.
Wyman Bros.	North American Indian Costumes, etc.; Copper, Stone and Flint Implements, etc; Collective Exhibit of Finished and Unfinished Implements from Kitchen Midden.
E. N. Rust, California.	Mealing or Grinding Stones for Preparing Food.
N. A. Phillips, M. D., Illinois.	Prehistoric Workshop.
E. H. Williams, Connecticut.	Stone Implements from Ancient Site in Connecticut.
Frances La Flesche, Washington, D. C.	Omaha Pipes of Friendship.
W. S. Cherry	Eth. Coll. from Congo Basin.
Bordon & Green, Indiana.	Stone Implements, Cache of Flints, etc.
C. W. Riggs, Arkansas.	Archæological Collection of Specimens taken from Mounds and Surface Finds—Mostly Pottery.

C. L. Davenport.	Eth. Coll. from West Africa.
E. Remeny.	Eth. Coll. from South Africa.
Edward H. Thompson.	Colored Plates Illustrating Antique Yucatan.
Carl Lumhotz.	Eth. Coll. from the Tarahuare Indians. the Tepenhumares. Tabares and Mayoo: Pottery from Casas Grandes: Prehistoric Crania from Caves in different localities in Tarahumare Land.
N. W. Chittenden.	Eth. Coll. from Alaska and British Columbia.

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THE KUSKARAWAOKES OF CAPTAIN JOHN SMITH.

[BY WILLIAM WALLACE TOOKER.]

Who were the *Kuskarawaokes*. and what was the signification of their name. are questions which have often puzzled those who have delved into the archives of aboriginal history or searched among the tortuous labyrinths of Indian traditions.

The total amount of our knowledge relating to this tribe of Indians is very meagre. and even that brief portion has not been analyzed with the care that it deserves. Their annals. after the departure of Smith from the Virginia colony. was a blank for many years. We can assume that they were frequently visited by Spelman. Argall. Croshaw. and others for the purposes of trade and traffic:* but no one continued the narrative of subsequent events with the historical and descriptive minuteness that characterizes the recital of Captain John Smith the intrepid Englishman. The more we study his works the more we learn and the higher the man rises in our estimation. Would that all who followed in his footsteps had performed their work half so well.

Many causes contributed their portion toward the obliteration of the *Kuskarawaokes* as a tribal organization. and which led finally to the subjugation and absorption of the remnant by neighboring tribes. In consequence. after the lapse of many years. when the settlement of their immediate country was begun by the English. nothing was left but their name as perpetuated by Smith. the decaying shells that whitened the sites of their villages. and the grassy circle that indicated the location of their wigwams.

Rev. Wm. M. Beauchamp. in his recent notes to Cusick's Six Nations.† suggests that Captain John Smith may have meant the *Tuscaroras*. by the *Kuscarawaokes*. a southern tribe. This is an utter impossibility. if we are to believe the linguistic evidence that can be brought to bear and accept what Smith has written upon this subject. The word *Tuscarora* might seem to have some affinity with the word *Kuskarawaoke*. at the first glance. without due study and research: but the fact that the *Tuscaroras* lived in another section of the country, were of *Iroquoian* stock, spoke their language, and that their name, according to Mr, Beauchamp, should be translated as "the shirt-wearing people," or, as they term themselves, *Skau-ro-na*, "wearing a shirt,' entirely prohibits this hypothesis of Mr. Beauchamp. Not only for the reasons given, but the additional one that the name *Kuskarawaoke* is absolutely pure Algonquian, as its analysis proves.

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*Smith's Works. Arber pp. 503. 511. 586.

†Iroquois Trail etc., 1892. p. 98.

The *Kuskarawaokes* were one of the tribes who were found located, in 1608, on the eastern shore of the Chesapeake bay, consequently were not a southern tribe from Smith's point of view, although they were from the an Iroquoian standpoint. In Smith's relation of their discovery* he says: "Repairing our sailes with our shirts we set saile for the maine, and fell in with a pretty convenient river on the east called Cuscarawaok. Here doth inhabite the people of *Sarapinagh, Nause, Arseck, and Nantaquak, the best marchants of all other savages.*" He also tells us of the river of *Kuscarawaok*, upon which he found seated a people with 200 men. On his map he locates a king's town called there *Cuskarawaok*, on a river abbreviated to "*Kus flu.*" While the surrounding country is marked as being under the dominion of this king, thus intimating that the term applied to all the tribes on the river, Smith's statement that there were only 200 men here would make on a very liberal estimate a total population of five hundred souls. As he mentions only four villages, and *Sarapinagh*, being the first mentioned and possibly the largest, was probably the real name of the one marked on the map as *Kuskarawaok*, and in *Sarapinagh* we find a duplicate of the Long Island, New York, *Sagaponack*, "a hard, ground-nut place," the stream, no doubt, is the one now known as the Nanticoke river. In the opinion of the best authorities, Bozman,† Dr Brinton,‡ and Mr. Mooney,§ it is considered that the tribe afterward known as the *Nanticokes*—who took their name originally from the village that Smith calls *Nantaquak*, "a point of land on a tidal stream"—included the descendants of all those river Indians who had survived the inroads of the *Massawomeks*, the *Sasquesahanoughs*, and other predatory tribes.

Smith imparts some facts in connection with this people which seem to have been entirely overlooked by all who have written upon the subject of the shell-money of the aborigines. It is remarkable that Dr. J. Hammond Trumbull did not recognize its bearing and quote it among his many notes on wampum. The only inference to be drawn from his neglect is that it must have remained unseen, although no one has been more thorough and painstaking in this line of etymological research than he. Prof. William H. Holmes, in his splendid memoir, "Art in Shell of the Ancient Americans,"* by far the best essay ever written on this theme, has also overlooked this passage.

These omissions have been partially due to the scarcity and inaccessibility of the various editions of Smith's works, now made easy of access to all scholars by the editing and publishing of every English edition of Smith's time, in one volume, by Prof. Edward Arber, of Birmingham, England.

The truths given to us by Smith are highly interesting and instructive, and not only bring up problems of Indian trade and traffic, but throw considerable light on what hitherto have been disputed points, as follows: "The cause of this discovery was to search [for] this mine, * * * also to search what furs, the best whereof is at Cuscarawaoke, where is made so much Rawranoke or white beads, that occasion as much dissention among savages as gold and silver amongst Christians."† The furs were not a product of the immediate locality, but were evidently brought from afar by other Indians in exchange for the white beads that were manufactured there. Thus it will be seen that the *Kuskarawaokes* were busy workers in the hive of industry, and that their handiwork was eagerly sought after by far-distant tribes, making them "the best marchants of all other savages." With this evidence from our authority the name resolves itself into the constituent parts of *Cusca-rawran-oke*. This resolution being made, it will be observed that it derives its name from the same combination of circumstances that gave Roanoke island its appellation twenty-three years previous, or now over three centuries ago.

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*Smith's Works, Arber, pp. 414, 415.

†Hist. Maryland, Vol. I, pp. 112, 114.

‡Lenape and their Legends, p. 23.

§Amer. Anthropologist, Vol. II, p. 261.

The prefix *kusk*-, *kusc*-, or *cusc*-, with the verbal formative *a*, as we find it varied by Smith, denotes the action of making or doing, as he translates it. Therefore it is the dialectic parallel of the Lenape objective-intensive root, *gisch* or *kich*, denoting successful action, of which Dr. Brinton quotes numerour examples.* For instance, *gisch-ihän*, "to create with the hands, to make something;" *gisch-ikhkn*, "to finish a house;" *gisch-enachk*, "the fence is finished."† It is also related to the Massachusetts *kezhik*, "to make;" *keste-oog*, "they make." Dr. Brinton remarks: "Numerous other derivations could be added. Howse considers it identical with the root *kitch*, great, large.‡ This would greatly increase its derivations. They certainly appear allied. In Cree, Lacombe gives *kitchi*, great; and *kije*, finished, perfect, both being applied to divinity."§ Dr. Trumbull, in his notes to *kéesuck*, Delaware, *gischuch*, sun, moon, heavens (compare *k̇eskowghs*, sunnes, J. Smith's Vocab.), says: "This word is related to the animate verb *kezheau*, 'he gives life to,' makes alive (and by which Eliot translates the verb 'creates') signifies, primarily, the sun, as the source of light and heat; (2) the visible heavens, coelum; (3) the space of a day, 'one sun,'‖ while Dr. Brinton suggests that 'the idea appears to be the beginning of a period of time, with the collateral notion of prosperous activity'," thus agreeing with Dr. Trumbull partly.

The second component, *Rawranoke* (Smith), "white beads," *Rarenaw* (Strachey), "cheyne" [of white beads] = *Roanoac* of Hariot, and *Roenoke* of the later historians.

To my knowledge Dr. Trumbull has never proposed an etymology for the word *Roanoke*, although referring to it as being the southern term for wampum, the shell-money of the north. In this statement he has simply followed the earlier writers, Beverly, Lawson, Byrd, and others. I may be considered

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*Second Annual Report of the Bureau of Ethnology.

†Smith's Works, Arber, p. 418.

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*Lenape and their Legends, pp. 102, 103.

†Lenape-English Dict., Brinton.

‡Grammar of the Cree, p. 175.

§Lenape and their Legends, pp. 103, 104.

‖Nan. Club, Rep. of R. Williams' Key, p. 104.

overconfident in suggesting. providing Dr. Trumbull failed to discover it, which seems to be evident, but yet its true synthesis can be given, as I hope to demonstrate satisfactorily to those who are interested in this branch of anthropology. In many Indian geographical names occurring on Long Island, N. Y, the early settlers, both English and Dutch, as I have previously shown,* frequently, as recorded in various documents, and some retained to this day, made use of the sound *rau* for *wau*, *ron* for *won*, *run* for *wun*, *rin* for *win*, etc., the retention or use of this sound in many instances being error of the ear (otosis, as has been termed), a mishearing or misapprehension of the sounds uttered according to Dr., Trumbull. In other cases the retention was due to ease of utterance, for getting rid of harsh sounds and making the word more euphonious to the ear. In the Narragansett language Roger Williams used *wau* as a contraction for *womp*, "white," † as in *wau-ompeg*, "white strung beads," *-ompeg* being a generic suffix to denote a string of shell-money. Therefore Smith's *raw*, Strachey's *rar*, Hariot's *ro*, being the varying prefix of the same word and translated by Smith as "white," is necessarily identical with Roger Williams' *wau*. In the same languge he gives us *anawsuck*, "shells," which also appears in the componnd word *suckau-anau-suck*, "the black or dark-colored shells," the terminal *-suck* (= Eliot's *-sog* or *-suog*) being added to denote the animate plural, leaving the verbal radical *anaw* or *anau* (= Massachusetts (Cotton) *anna*, "a shell," corresponding to *-anaw* or *-enaw* of Smith and Strachey), thus making *rarenaw* the equivalent of the Narragansett *wau-anaw*, "white shell;" hence by metonymy used to denote "beads," because primarily small shells were simply perforated and strung, or, as Beverly wrote: "Some is made of cockel shell broken into small bits, with rough edges, drilled through in same manner as beads, and this they call Roenoke and use it as peak." ‡

In the third component, which is the terminal affix *-oke* (Smith), *-oc* (Hariot) is found the locative generic for "place" or "country" resulting in the synthesis of *Kusca-wau-anau-ock*, "a place of making white beads," or with Smith, "where is made so much white beads;" in *Ro-ano-ac*, "a white shell place." For similar reasons Long Island, New York, was termed *Meitowax=Meht-anaw-ack*, "the land of the periwinkle" or "the country of the ear shell," and also *Seawan-hacky*, "the seawan country," because the first (*Pyrula canaliculata* and *Pyrula carica*) were found in great abundance, as they are to-day, and that seawan, "loose beads," were manufactured there.

If I should, with Howse and Dr. Brinton, consider the Deleware root *gisch*, Powhatan k*esk*, as being identical or allied with the root k*utch*, Massachusetts k*ishki* or k*utchi*, "principal," "great," "large," "preëminent," used as a prefix to many Indian place-names throughout New England and occurring in *Kiskiack*, a King's town on Smith's map, it would not alter the meaning to any appreciable extent, for then the name would be translated as "the principal place of white beads," the idea of making being collateral; all of which is respectfully submitted to those interested in the study of Indian nomenclature and the early history of the Indian tribes of the Atlantic seaboard.

—From The American Anthropologist for October, 1893.

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* Indian names in Brooklyn, Brooklyn Eagle Almanac, 1893.

† Nan. Club Rep. of R. Williams' Key, p. 176.

‡ Beverly, Hist. Virginia.

MEDICINE ARROWS OF THE OREGON INDIANS.

[FROM JOURNAL OF AMERICAN FOLK-LORE.]

There are two kinds of the quaint and remarkable curing implements made by the Klamath Lake (É-ukshikni) and the Modoc (Mo'atokni) Indians of southwestern Oregon, and both, though of different operative faculties, are intended to supplement each other. The hänä'sish or hä'näs are always made in pairs; the tchúpash are used single only.

A. The hänä'sish have the appearance of all the other painted and feathered arrows, but not being armed with tips of iron, glass, or stone, they come under the category of arrows of play, táldshi. They are from two to three feet long, consist of various wood-material, and are intended only for curing or treating patients. The spirit of the medicine tools, múluasham sko'ks, has to call for them through the conjurer, ki'uks, and the conjurer then sticks them into the ground, one on each side of the sufferer's couch. The office of the arrows is to keep the person's soul there, to scare away the disease, or to pin it down and kill it, and therefore they are given the shape of a weapon. When one or more pairs of the hänä'sish are seen sticking around a patient's bed, the public may rest assured that the conjurer has very strong hopes of restoring the person to health. When the arrows are handled in the correct manner, the patient will recover within a short time: but pulling them up before he or she is entirely well would kill the sufferer, or make him as sick as he was before. Any kind of songs can be sung to them while they stand there for days; either the song of the spider, lightning, cloud, or wind, for instance. The utüssusá-ash song-medicine, which is of help against all distempers, sometimes calls for these arrows. This is a spirit well known in Oregonian mythology on account of its clownish and burlesque acts, and appears to form a parallel to the Yenadizze of Longfellow's "Hiawatha." The hänä'sish arrow species is known to the California Indians also, for the Pit River language calls it lashtcha'ka.

A pair of the hänä'sish were sent for exhibition to the World's Fair in March, 1893.

B. The tchúpash is another feathered medicine-arrow in use among the same tribes. It is commonly longer than the hana'sish, sometimes up to three feet, cigar-shaped, tapering off at both ends, and provided with fliers. The use of a pair of hana'sish-arrows demands the simultaneous use of one tchúpash-arrow; its purpose is to improve the medical power of the conjurer by calling up other defunct animal spirits to assist him in becoming a "strong doctor." Its employment prescribes a dance lasting five days and five nights. The tchúpash, being a weapon also, catches the disease of the patient and brings it to a deep earth-pit, called shlokopash, where it is fastened and destroyed. These wide "medicine-pits" were formerly the dwelling-places of the conjurers, or medicine-men.

ALBERT S. GATSCHET.

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EDITORIAL.

The number before you which teems with interesting archæological matter completes Volume 1, of "The Archæologist."

From the beginning to the ending number of the journal we have exerted ourselves to please those who have become our subscribers. Taking into consideration our means, which are certainly limited, we should not be considered egotistical, when it is stated that before you has been placed a magazine, which has commanded kind notices from learned archæologists, who have proved their utterances by not alone becoming subscribers but also by contributing valuable papers. To these patrons we are indeed thankful, and hope in the future they will still extend toward us the same benevolent feeling. We promise that Volume II shall be made still more interesting. There are now in the hands of the editor articles for the first number of Volume II, which will surely be very acceptable to our readers. In this same strain it is proposed to continue. The editor would ask advice from the readers of the magazine. He is aware that in this manner can it be strengthened and made the organ or mouthpiece of archæological writers. Nor is he an autocrat who thinks he alone can best serve the interest of the journal without advice. He is pleased to say that friends have given admonition which has been of great value. Keep on! It proves that you are our friends and wish us success. We need you and more of just such friends and well wishers. A. F. B.

BOOK REVIEW.

Eighth Annual Report of the Bureau of Ethnology. J. W. Powell, Director, Washington, D. C.

This volume like those preceding it is a valuable contribution to American Anthropology. In it are contained papers worthy of careful study by those interested, which were written by members of the above bureau. The introduction by the director is an annual statement of the field work done by the members ending with a presentation of the conditions of the finances.

It may perhaps be interesting to many of our readers to know who are members of this famous bureau. They are Major J. W. Powell, who, as above stated, is the director; Prof. Cyrus Thomas, Mr. Gerard Fowke, Mr. H. L. Reynolds, Mr. J. D. Middleton, Mr. J. C. Pilling, Mr. Frank H. Cushing, Mr. William. H. Holmes, Messrs. Victor and Cosmos Minderleff, Mr. E. W. Nelson, Mr. Lucien M. Turner, Mr. Henry W. Henshaw, Col. Garrick Mallory, Mr. James Mooney, Mr. John N. B. Hewitt, Mr. Albert S. Gatschet. Mr. J. Owen Dorsey, Dr.

Walter J. Hoffman and Mr. Jeremiah Curtin. This is quite a formidable array of anthropological talent. A few of these gentlemen have made themselves known to our readers. We hope the remainder will, during the coming year, not be backward in coming forward. To each of these scientists is allotted a certain portion of work to do, and how ably it is always done, is made manifest by an examination of the eight large quarto volumes published.

The accompanying papers are: A Study of Pueblo architecture; Tusayan and Cibola, by Victor Mindeleff, page 228, Plates CIX and Fig. 114. Besides a complete description of the mode of building by the Pueblo, Indians, there is also given an account of their myths and traditions.

Ceremonial of Hasjelti Dailjis and Mythical Sand Painting of the Navajo Indians, by James Stevenson, P. 58, Colored Plates XII, Fig. 4. As Col. Stevenson is dead, this was undoubtedly the last paper written by him. It is a description of a singular and interesting performance, called a healing ceremonial. During their rites, which last for a number of days, are produced what the writer terms sand paintings. These pictures were laid on the surface, and the ground work was formed by a common yellowish sand, brought in blankets in lesser or greater quantity as the painting required. The extra colors are red, black, drab, etc., and the figures in nearly all instances were grotesque representations of human beings. They often covered much space and were very elaborate. A. F. B.

CORRESPONDENCE.

Ed. Archæologist:

On examining a chipped flint collected by me to-day out of my favorite bank ten feet below the surface in undisturbed glacial drift, (loss) I discovered on the decayed end, a few fossil crinoid stems—the larger of these had been scored out with a chipper 1⅝ of an inch in diameter, leaving a pretty matrix in the stone. I then re-examined some former finds of this style of stone, and found that a few of them too had been scored out in the same way. Now it occurred to me that if Paleontologists would report such finds of flints, chipped for the *fossils*, to one publication such reports, might show the occurrence of these chipped flints on some extended line—and if so it might reveal something of interest to scientists; as did the line of raw copper slugs from Lake Superior to the Ohio river, or terminal moraines. O. P. Helton,

Shelbyville, Ill., Nov. 28. 1893.

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Ed. Archæologist:

About fifteen miles down the Missouri river from Atchison, is the historic town of Kickapoo, which was named from the Kickapoo Indians who originally occupied the town site. Many relics of this tribe are found at the place while digging wells, cellars and post holes, and the farmers occasionally find them in the fields. Mr. Adkinson, while digging a cellar on his farm, near the town site, unearthed an iron tomahawk, a gun barrel and other things. Mr. Baker, an old citizen says that his house stands in the center of an Indian burying ground. While digging post holes he unearthed the remains of several skeletons together with a quantity of glass beads. The Kickapoo Indians once had an extensive village here and the remains of their lodges are everywhere to be seen.

The writer will shortly make an examination of the old village and if any interesting developements are made he will communicate the same to the readers of the Archæologist.

I was much pleased with the contents and general appearance of the November number, and must say that it is a great improvement. I wish the magazine success. You can count me as a life long subscriber.

GEO. J. REMSBURG, 500 S. 4th St.
ATCHISON, KAN., NOV. 20, 1893.

* * *

ED. ARCHÆOLOGIST:

In writing on "Relics on the Kaskaskia river, Mr. J. R. Nissley, in the November number of The Archæologist, says: "This river is here called the Okaw. Why the natives prefer this name to that given by the geographers the writer has not been able to ascertain." I will tell him. It was for convenience of pronunciation; as James is called Jim, John is known as Jack, Robert as Bob, etc. This abreviation of names was characteristic of the early French settlers, who were averse to exertion—even in talking—and always adopted the easiest way in speech as well as in work. Peoria was known to them as simply Pá, or *au* Pá; Cahokia was curtailed to *au* Caho.; and the old *habitants* of Lower Canada seldom mention Quebec now otherwise than *au* Fort—at or to the fort.

To them the Indian name Kaskaskia, was too long and inconvenient, so they abbreviated it to the first sylable, and invariably alluded to the place, in conversation, as *au* Kas, pronounced *awe Kah*, or *au Kah*, and meaning at or to Kaskaskia.

After the Revolutionary war there was a rapid influx of Virginians and Kentuckians to the borders of the Kaskaskia river, who, ignorant of the Creole dialect, soon Anglicized the au Kah of the French to au Kaw and finally to Okaw, and this uncouth perversion of a simple abreviation has ever since been fastened to this historic river.

By the same stupid vitiation of phonetics the Indian and French pronunciation of Arkansas—Ar-kon-sah—has been, by the illiterate coon-hunters, of that state, barbarized to Arkan-*saw*; and a legislature, such as no other state in the Union could produce has fixed that insignia of ignorance by statute. J. F. SNYDER, M. D.

VIRGINIA, ILL.

NOTES AND NEWS.

Not long ago, at the Fair, a gentleman and the writer heard a certain person, very prominent in archæologic circles, say that he was the first man in the world to institute practical scientific exploration of prehistoric remains. This well known gentleman further stated that the scheme of examining mounds or village sites, caves etc., by marking the area to be explored so that a ground plan to a scale could be drawn, was his own.

As it may not be known to the readers of the Archæologist who really did originate the laying off of mounds, earthworks, etc., into square yards or similar schemes of measurement, the writer takes pleasure in calling your attention to the Birmingham meeting of the Brittish Association for the Advancement of Science held in 1865. A report was read upon work done the year before at famous Kent's Cavern. According to the report (which is in part published in "Proceedings of United States National Museum," Vol. XI, Appendix) the cave was laid off in squares and a record kept of what was found in each square. Separate boxes contained the contents of the squares. This was first done in 1864, long before any such work was dreamed of in America. Squier and Davis and all of the early investigators here never attempted such detailed, expensive examinations. It was not until late in the Seventies that archæologic work in America reached an equally high plane.

The Columbian Museum now has an endowment of $2,200,000, and bids fair to outrank all institutions of like character in the country, save the Smithsonian and United States National Museum. The people of Chicago have been generous in endowing it so nobly. The management, now that it has so large a sum on hand, should not make the mistake of buying generally. The temptation to purchase everything in sight, is strong. There will be many persons who have poor or over-rated collections to offer at fancy figures. Most of the men connected with the institution have more knowledge of their business affairs than of the management of a great museum. It becomes them therefore to look to persons of archæologic training for advice before making purchases.

Men who have spent great sums of money in gathering a large collection and especially foreigners, are anxious to sell to the Columbian Museum at a great profit. It is possible, we do not say probable, that sums of money may be offered as "commissions" to anyone connected with the museum who will help the seller by recommending his goods. Fortunately the gentlemen of the institution have guarded against this wrong: Otherwise, it can be easily understood how one "on the inside" possessing the confidence of his employers, could, by a politic stroke advance his personal gain.

The museum has had many thousands of valuable objects donated it. It has also received, with as good grace as the circumstances would permit, lots of worthless trash for which it has no use. For example, an enormous petition signed by over 68,000 people, the property of a politician is offered to the museum. Other gifts equally valueless have been acquired. After the givers have left, the Chicago Museum assistants may find occupation during their leisure hours in destroying such gifts.

It has not been decided where the first exploring expedition sent out by the museum will locate. The Archæologist will keep abreast of its researches and discoveries wherever it may go and we shall present to our readers from time to time descriptions of its most important finds.

Articles of the near future:
Primitive Trephining,
Prof. W. J. McGee:
Information for Collector,
W. K. Moorehead:
The Archæology of Peru, (to be continued through three numbers.)
Geo. A. Dorsey.

Articles by Frank Cushing, Thomas Wilson, and others.

The series which The Archæologist will soon present to its readers has special value in that each author writes of some department of archæology in which he has especially distinguished himself. These articles will be so numerous that all the details of the science shall de covered.

What had been long suspected is now established, through the discovery and descriptions of M. M. Lohest and Fraipont, of Liege, viz: that there dwelt in Europe during paleolithic times a race of men which possessed a greater number of simioid characteristics than any which has been discovered elsewhere. The important discovery in the grotto of Spy, of two skeletons almost complete, served to unify knowledge of this race, which had previously rested on isolated fragments only. These skeletons proved what had been previously only surmised, that the skeleton of Neanderthal, the lower jaw of Naulette, and the crania of Cannstadt, belong to one and the same race. The simian characters of these parts of the skeleton are well known. These are the enormous superciliary ridges and glabella, the retreating frontal region, the thickness of the cranial wall, the massive mandibular ramus with rudimentary chin, and the large size of the posterior molars.

M. M. Fraipont and Lohest have added other very important characters to these—.Prof. E. D. Cope on "The Geneology of Man," in Scientific American, supplement, No. 905.

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